

**BEFORE THE UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

In the Matter of the:

Order Granting Temporary Conditional Exemptive Relief Pursuant to Section 36 of the Securities Exchange Act of 1934 (“Exchange Act”) and Rule 608(e) of Regulation NMS Under the Exchange Act, Relating to Certain Requirements of the National Market System Plan Governing the Consolidated Audit Trail

Release No. 34-90688 (Dec. 16, 2020)
85 Fed. Reg. 83634 (Dec. 22, 2020)

In the Matter of the:

Order Granting Temporary Exemptive Relief, Pursuant to Section 36 of the Securities Exchange Act of 1934 (“Exchange Act”) and Rule 608(e) of Regulation NMS Under the Exchange Act, From Section 8.1.1 and Section 8.1.2 of Appendix D of the National Market System Plan Governing the Consolidated Audit Trail

Release No. 34-90689 (Dec. 16, 2020)
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**PUBLIC APPENDIX IN SUPPORT OF
MOTIONS FOR PARTIAL STAY OF ORDERS 34-90688 AND 34-90689
VOLUME 1 OF 2**

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EXHIBIT 1

**LIMITED LIABILITY COMPANY AGREEMENT
OF
CONSOLIDATED AUDIT TRAIL, LLC
a Delaware Limited Liability Company**

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**LIMITED LIABILITY COMPANY AGREEMENT
OF
CONSOLIDATED AUDIT TRAIL, LLC
a Delaware Limited Liability Company**

This Limited Liability Company Agreement (including its Recitals and the Exhibits, Appendices, Attachments, and Schedules identified herein, this “Agreement”) of CONSOLIDATED AUDIT TRAIL, LLC, a Delaware limited liability company (the “Company”), dated as of the 29th day of August, 2019, is made and entered into by and among the Participants.

RECITALS

- A. Prior to the formation of the Company, in response to SEC Rule 613 requiring national securities exchanges and national securities associations to submit a national market system plan to the Securities and Exchange Commission (“Commission” or “SEC”) to create, implement and maintain a consolidated audit trail, such national securities exchanges and national securities associations, pursuant to SEC Rule 608(a)(3), which authorizes them to act jointly in preparing, filing and implementing national market system plans, developed the National Market System Plan Governing the Process for Selecting a Plan Processor and Developing a Plan for the Consolidated Audit Trail (the “Selection Plan”). The Selection Plan was approved by the Commission on February 21, 2014, amended on June 17, 2015 and September 24, 2015, and, by its terms, shall automatically terminate upon the Commission’s approval of this Agreement.
- B. The Participants have now determined that it is advantageous and desirable to conduct in a limited liability company the activities they have heretofore conducted as parties to the Selection Plan, and have formed the Company for this purpose. This Agreement, which takes the place of the Selection Plan, is a National Market System Plan as defined in SEC Rule 600(b)(43), and serves as the National Market System Plan required by SEC Rule 613. The Participants shall jointly own the Company, which shall create, implement, and maintain the CAT and the Central Repository pursuant to SEC Rule 608 and SEC Rule 613.
- C. This Agreement incorporates the exemptive relief from certain provisions of SEC Rule 613 requested in the original and supplemental request letters submitted by the Participants to the Commission, as described further in Appendix C (“Exemptive Request Letters”).

ARTICLE I

DEFINITIONS

Section 1.1. Definitions. As used throughout this Agreement (including, for the avoidance of doubt, the Exhibits, Appendices, Attachments, Recitals and Schedules identified in this Agreement):

“Account Effective Date” means: (a) with regard to those circumstances in which an Industry Member has established a trading relationship with an institution but has not established an account with that institution, (i) when the trading relationship was established prior to the implementation date of the CAT NMS Plan applicable to the

relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), either (A) the date the relationship identifier was established within the Industry Member, (B) the date when trading began (i.e., the date the first order was received) using the relevant relationship identifier, or (C) if both dates are available, the earlier date will be used to the extent that the dates differ; or (ii) when the trading relationship was established on or after the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), the date the Industry Member established the relationship identifier, which would be no later than the date the first order was received; (b) where an Industry Member changes back office providers or clearing firms prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), the date an account was established at the relevant Industry Member, either directly or via transfer; (c) where an Industry Member acquires another Industry Member prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), the date an account was established at the relevant Industry Member, either directly or via transfer; (d) where there are multiple dates associated with an account established prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), the earliest available date; (e) with regard to Industry Member proprietary accounts established prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), (i) the date established for the account in the Industry Member or in a system of the Industry Member or (ii) the date when proprietary trading began in the account (i.e., the date on which the first orders were submitted from the account). With regard to paragraphs (b) – (e), the Account Effective Date will be no later than the date trading occurs at the Industry Member or in the Industry Member’s system.

“Active Accounts” means an account that has had activity in Eligible Securities within the last six months.

“Advisory Committee” has the meaning set forth in Section 4.13(a).

“Affiliate” of a Person means any Person controlling, controlled by, or under common control with such Person.

“Affiliated Participant” means any Participant controlling, controlled by, or under common control with another Participant.

“Agreement” has the meaning set forth in the preamble to this Agreement.

“Allocation Report” means a report made to the Central Repository by an Industry Member that identifies the Firm Designated ID for any account(s), including subaccount(s), to which executed shares are allocated and provides the security that has been allocated, the identifier of the firm reporting the allocation, the price per share of shares allocated, the side of shares allocated, the number of shares allocated to each account, and the time of the allocation; provided, for the avoidance of doubt, any such Allocation Report shall not be required to be linked to particular orders or executions.

“Bid” means a proposal submitted by a Bidder in response to the RFP or subsequent request for proposal (or similar request).

“Bidder” means any entity, or any combination of separate entities, submitting a Bid.

“Bidding Participant” means a Participant that: (a) submits a Bid; (b) is an Affiliate of an entity that submits a Bid; or (c) is included, or is an Affiliate of an entity that is included, as a Material Subcontractor as part of a Bid.

“Business Clock” means a clock used to record the date and time of any Reportable Event required to be reported under SEC Rule 613.

“CAT” means the consolidated audit trail contemplated by SEC Rule 613.

“CAT Data” means data derived from Participant Data, Industry Member Data, SIP Data, and such other data as the Operating Committee may designate as “CAT Data” from time to time.

“CAT NMS Plan” means the plan set forth in this Agreement, as amended from time to time.

“CAT-Order-ID” has the same meaning provided in SEC Rule 613(j)(1).

“CAT Reporter” means each national securities exchange, national securities association and Industry Member that is required to record and report information to the Central Repository pursuant to SEC Rule 613(c).

“CAT-Reporter-ID” has the same meaning provided in SEC Rule 613(j)(2).

“CAT System” means all data processing equipment, communications facilities, and other facilities, including equipment, utilized by the Company or any third parties acting on the Company’s behalf in connection with operation of the CAT and any related information or relevant systems pursuant to this Agreement.

“Central Repository” means the repository responsible for the receipt, consolidation, and retention of all information reported to the CAT pursuant to SEC Rule 613 and this Agreement.

“Certificate” has the meaning set forth in Section 2.2.

“Chair” has the meaning set forth in Section 4.2(b).

“Chief Compliance Officer” means the individual then serving (even on a temporary basis) as the Chief Compliance Officer pursuant to Section 4.6, Section 6.1(b), and Section 6.2(a).

“Chief Information Security Officer” means the individual then serving (even on a temporary basis) as the Chief Information Security Officer pursuant to Section 4.6, Section 6.1(b), and Section 6.2(b).

“Code” means the Internal Revenue Code of 1986.

“Company” has the meaning set forth in the preamble to this Agreement.

“Company Interest” means any membership interest in the Company at any particular time, including the right to any and all benefits to which a Participant may be entitled under this Agreement and the Delaware Act, together with the obligations of such Participant to comply with this Agreement.

“Commission” or “SEC” means the United States Securities and Exchange Commission.

“Compliance Rule” means, with respect to a Participant, the rule(s) promulgated by such Participant as contemplated by Section 3.11.

“Compliance Subcommittee” has the meaning set forth in Section 4.12(b).

“Compliance Threshold” has the meaning set forth in Appendix C.

“Conflict of Interest” means that the interest of a Participant (e.g., commercial, reputational, regulatory or otherwise) in the matter that is subject to a vote: (a) interferes, or would be reasonably likely to interfere, with that Participant’s objective consideration of the matter; or (b) is, or would be reasonably likely to be, inconsistent with the purpose and objectives of the Company and the CAT, taking into account all relevant considerations including whether a Participant that may otherwise have a conflict of interest has established appropriate safeguards to eliminate such conflict of interest and taking into account the other guiding principles set forth in this Agreement. If a Participant has a “Conflict of Interest” in a particular matter, then each of its Affiliated Participants shall be deemed to have a “Conflict of Interest” in such matter. A “Conflict of Interest” with respect to a Participant includes the situations set forth in Sections 4.3(b)(iv), 4.3(d)(i) and 4.3(d)(ii).

“Customer” has the same meaning provided in SEC Rule 613(j)(3).

“Customer Account Information” shall include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable); except, however, that (a) in those circumstances in which an Industry Member has established a trading relationship with an institution but has not established an account with that institution, the Industry Member will (i) provide the Account Effective Date in lieu of the “date account opened”; (ii) provide the relationship identifier in lieu of the “account number”; and (iii) identify the “account type” as a “relationship”; (b) in those circumstances in which the relevant account was established prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), and no “date account opened” is available for the account, the Industry Member will provide the Account Effective Date in the following circumstances: (i) where an Industry Member changes back office providers or clearing firms and the date account opened is changed to the date the account was opened on the new back office/clearing firm system; (ii) where an Industry Member acquires another Industry Member and the date account opened is changed to the date the account was opened on the post-merger back office/clearing firm system; (iii) where there are multiple dates associated with an account in an Industry Member’s system, and the parameters of each date are determined by the

individual Industry Member; and (iv) where the relevant account is an Industry Member proprietary account.

“Customer-ID” has the same meaning provided in SEC Rule 613(j)(5).

“Customer Identifying Information” means information of sufficient detail to identify a Customer, including, but not limited to, (a) with respect to individuals: name, address, date of birth, individual tax payer identification number (“ITIN”)/social security number (“SSN”), individual’s role in the account (e.g., primary holder, joint holder, guardian, trustee, person with the power of attorney); and (b) with respect to legal entities: name, address, Employer Identification Number (“EIN”)/Legal Entity Identifier (“LEI”) or other comparable common entity identifier, if applicable; provided, however, that an Industry Member that has an LEI for a Customer must submit the Customer’s LEI in addition to other information of sufficient detail to identify a Customer.

“Delaware Act” means the Delaware Limited Liability Company Act.

“Disclosing Party” has the meaning set forth in Section 9.6(a).

“Effective Date” means the date of approval of this Agreement by the Commission.

“Eligible Security” includes (a) all NMS Securities and (b) all OTC Equity Securities.

“Error Rate” has the meaning provided in SEC Rule 613(j)(6).

“Exchange Act” means the Securities Exchange Act of 1934.

“Execution Venue” means a Participant or an alternative trading system (“ATS”) (as defined in Rule 300 of Regulation ATS) that operates pursuant to Rule 301 of Regulation ATS (excluding any such ATS that does not execute orders).

“Exemptive Request Letters” has the meaning set forth in Recital C.

“Financial Accountability Milestone” means, as the case may be, Full Implementation of Core Equity Reporting, Full Availability and Regulatory Utilization of Transactional Database Functionality, and Full Implementation of CAT NMS Plan Requirements.

“FINRA” means Financial Industry Regulatory Authority, Inc.

“Firm Designated ID” means (1) a unique and persistent identifier for each trading account designated by Industry Members for purposes of providing data to the Central Repository provided, however, such identifier may not be the account number for such trading account if the trading account is not a proprietary account; (2) a unique and persistent relationship identifier when an Industry Member does not have an account number available to its order handling and/or execution system at the time of order receipt, provided, however, such identifier must be masked; or (3) a unique and persistent entity identifier when an employee of an Industry Member is exercising discretion over multiple client accounts and creates an aggregated order for which a trading account number of the Industry Member is not available at

the time of order origination, where each such identifier is unique among all identifiers from any given Industry Member.

“Fiscal Year” means the fiscal year of the Company determined pursuant to Section 9.2(a).

“FS-ISAC” has the meaning set forth in Section 6.2(b)(vi).

“Full Availability and Regulatory Utilization of Transactional Database Functionality” means the point at which: (a) reporting to the Order Audit Trail System (“OATS”) is no longer required for new orders; (b) Industry Member reporting for equities transactions and simple electronic options transactions, excluding Customer Account Information, Customer-ID, and Customer Identifying Information, with sufficient intra-firm linkage, inter-firm linkage, national securities exchange linkage, trade reporting facilities linkage, and representative order linkages (including any equities allocation information provided in an Allocation Report) to permit the Participants and the Commission to analyze the full lifecycle of an order across the national market system, from order origination through order execution or order cancellation, is developed, tested, and implemented at a 5% Error Rate or less; (c) Industry Member reporting for manual options transactions and complex options transactions, excluding Customer Account Information, Customer-ID, and Customer Identifying Information, with all required linkages to permit the Participants and the Commission to analyze the full lifecycle of an order across the national market system, from order origination through order execution or order cancellation, including any options allocation information provided in an Allocation Report, is developed, tested, and fully implemented; (d) the query tool functionality required by Section 6.10(c)(i)(A) and Appendix D, Sections 8.1.1-8.1.3, Section 8.2.1, and Section 8.5 incorporates the data described in conditions (b)-(c) and is available to the Participants and to the Commission; and (e) the requirements of Section 6.10(a) are met. This Financial Accountability Milestone shall be considered complete as of the date identified in a Quarterly Progress Report meeting the requirements of Section 6.6(c).

“Full Implementation of CAT NMS Plan Requirements” means the point at which the Participants have satisfied all of their obligations to build and implement the CAT, such that all CAT system functionality required by Rule 613 and the CAT NMS Plan has been developed, successfully tested, and fully implemented at the initial Error Rates specified by Section 6.5(d)(i) or less, including functionality that efficiently permits the Participants and the Commission to access all CAT Data required to be stored in the Central Repository pursuant to Section 6.5(a), including Customer Account Information, Customer-ID, Customer Identifying Information, and Allocation Reports, and to analyze the full lifecycle of an order across the national market system, from order origination through order execution or order cancellation, including any related allocation information provided in an Allocation Report. This Financial Accountability Milestone shall be considered complete as of the date identified in a Quarterly Progress Report meeting the requirements of Section 6.6(c).

“Full Implementation of Core Equity Reporting Requirements” means the point at which: (a) Industry Member reporting (excluding reporting by Small Industry Members that are not OATS reporters) for equities transactions, excluding Customer Account Information, Customer-ID, and Customer Identifying Information, is developed, tested, and implemented at a 5% Error

Rate or less and with sufficient intra-firm linkage, inter-firm linkage, national securities exchange linkage, and trade reporting facilities linkage to permit the Participants and the Commission to analyze the full lifecycle of an order across the national market system, excluding linkage of representative orders, from order origination through order execution or order cancellation; and (b) the query tool functionality required by Section 6.10(c)(i)(A) and Appendix D, Sections 8.1.1-8.1.3 and Section 8.2.1 incorporates the Industry Member equities transaction data described in condition (a) and is available to the Participants and to the Commission. This Financial Accountability Milestone shall be considered complete as of the date identified in a Quarterly Progress Report meeting the requirements of Section 6.6(c).

“GAAP” means United States generally accepted accounting principles.

“Independent Auditor” has the meaning set forth in Section 6.2(a)(v)(B).

“Industry Member” means a member of a national securities exchange or a member of a national securities association.

“Industry Member Data” has the meaning set forth in Section 6.4(d)(ii).

“Information” has the meaning set forth in Section 9.6(a).

“Initial Industry Member Core Equity and Option Reporting” means the reporting by Industry Members (excluding Small Industry Members that are not OATS reporters) of both: (a) equities transaction data, excluding Customer Account Information, Customer-ID, and Customer Identifying Information; and (b) options transaction data, excluding Customer Account Information, Customer-ID, and Customer Identifying Information.

“Initial Plan Processor” means the first Plan Processor selected by the Operating Committee in accordance with SEC Rule 613, Section 6.1 and the Selection Plan.

“Last Sale Report” means any last sale report reported pursuant to the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information filed with the SEC pursuant to, and meeting the requirements of, SEC Rule 608.

“Latency” means the delay between input into a system and the outcome based upon that input. In computer networks, latency refers to the delay between a source system sending a packet or message, and the destination system receiving such packet or message.

“Listed Option” or “Option” have the meaning set forth in Rule 600(b)(35) of Regulation NMS.

“Majority Vote” means the affirmative vote of at least a majority of all of the members of the Operating Committee or any Subcommittee, as applicable, authorized to cast a vote with respect to a matter presented for a vote (whether or not such a member is present at any meeting at which a vote is taken) by the Operating Committee or any Subcommittee, as applicable (excluding, for the avoidance of doubt, any member of the Operating Committee or any Subcommittee, as applicable, that is recused or subject to a vote to recuse from such matter pursuant to Section 4.3(d)).

“Manual Order Event” means a non-electronic communication of order-related information for which CAT Reporters must record and report the time of the event.

“Material Amendment” has the meaning set forth in Section 6.9(c).

“Material Contract” means any: (a) contract between the Company and the Plan Processor; (b) contract between the Company and any Officer; (c) contract, or group of related contracts, resulting in a total cost or liability to the Company of more than \$900,000; (d) contract between the Company, on the one hand, and a Participant or an Affiliate of a Participant, on the other; (e) contract containing other than reasonable arms-length terms; (f) contract imposing, or purporting to impose, non-customary restrictions (including non-competition, non-solicitation or confidentiality (other than customary confidentiality agreements entered into in the ordinary course of business that do not restrict, or purport to restrict, any Participant or any Affiliate of any Participant)) or obligations (including indemnity, most-favored nation requirements, exclusivity, or guaranteed minimum purchase commitments) on the Company or any Participant or any Affiliate of a Participant; (g) contract containing terms that would reasonably be expected to unduly interfere with or negatively impact the ability of the Company, any Participant or any Affiliate of any Participant to perform its regulatory functions (including disciplinary matters), to carry out its responsibilities under the Exchange Act or to perform its obligations under this Agreement; (h) contract providing for a term longer than twelve (12) months or the termination of which would reasonably be expected to materially and adversely affect the Company, any Participant or any Affiliate of a Participant; (i) contract for indebtedness, the disposition or acquisition of assets or equity, or the lease or license of assets or properties; or (j) joint venture or similar contract for cost or profit sharing.

“Material Subcontractor” means any entity that is known to the Participant to be included as part of a Bid as a vendor, subcontractor, service provider, or in any other similar capacity and, excluding products or services offered by the Participant to one or more Bidders on terms subject to a fee filing approved by the SEC: (a) is anticipated to derive 5% or more of its annual revenue in any given year from services provided in such capacity; or (b) accounts for 5% or more of the total estimated annual cost of the Bid for any given year. An entity shall not be considered a “Material Subcontractor” solely due to the entity providing services associated with any of the entity’s regulatory functions as a self-regulatory organization registered with the SEC.

“Material Systems Change” means any change or update to the CAT System made by the Plan Processor which will cause a significant change to the functionality of the Central Repository.

“Material Terms of the Order” includes: the NMS Security or OTC Equity Security symbol; security type; price (if applicable); size (displayed and non-displayed); side (buy/sell); order type; if a sell order, whether the order is long, short, short exempt; open/close indicator (except on transactions in equities); time in force (if applicable); if the order is for a Listed Option, option type (put/call), option symbol or root symbol, underlying symbol, strike price, expiration date, and open/close (except on market maker quotations); and any special handling instructions.

“National Best Bid” and “National Best Offer” have the same meaning provided in SEC Rule 600(b)(42).

“NMS Plan” has the same meaning as “National Market System Plan” provided in SEC Rule 613(a)(1) and SEC Rule 600(b)(43).

“NMS Security” means any security or class of securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan, or an effective national market system plan for reporting transactions in Listed Options.

“Non-SRO Bid” means a Bid that does not include a Bidding Participant.

“Officer” means an officer of the Company, in his or her capacity as such, as set forth in Section 4.6.

“Operating Committee” means the governing body of the Company designated as such and described in Article IV.

“Options Exchange” means a registered national securities exchange or automated trading facility of a registered securities association that trades Listed Options.

“Options Market Maker” means a broker-dealer registered with an exchange for the purpose of making markets in options contracts traded on the exchange.

“Order” or “order” has, with respect to Eligible Securities, the meaning set forth in SEC Rule 613(j)(8).

“OTC Equity Security” means any equity security, other than an NMS Security, subject to prompt last sale reporting rules of a registered national securities association and reported to one of such association’s equity trade reporting facilities.

“Other SLAs” has the meaning set forth in Section 6.1(h).

“Participant” means each Person identified as such on Exhibit A hereto, and any Person that becomes a Participant as permitted by this Agreement, in such Person’s capacity as a Participant in the Company (it being understood that the Participants shall comprise the “members” of the Company (as the term “member” is defined in Section 18-101(11) of the Delaware Act)).

“Participant Data” has the meaning set forth in Section 6.3(d).

“Participation Fee” has the meaning set forth in Section 3.3(a).

“Payment Date” has the meaning set forth in Section 3.7(b).

“Permitted Legal Basis” means the Participant has become exempt from, or otherwise has ceased to be subject to, SEC Rule 613 or has arranged to comply with SEC Rule 613 in some

manner other than through participation in this Agreement, in each instance subject to the approval of the Commission.

“Permitted Person” has the meaning set forth in Section 4.9.

“Permitted Transferee” has the meaning set forth in Section 3.4(c).

“Person” means any individual, partnership, limited liability company, corporation, joint venture, trust, business trust, cooperative or association and any heirs, executors, administrators, legal representatives, successors and assigns of such Person where the context so permits.

“PII” means personally identifiable information, including a social security number or tax identifier number or similar information; Customer Identifying Information and Customer Account Information.

“Plan Processor” means the Initial Plan Processor or any other Person selected by the Operating Committee pursuant to SEC Rule 613 and Sections 4.3(b)(i) and 6.1, and with regard to the Initial Plan Processor, the Selection Plan, to perform the CAT processing functions required by SEC Rule 613 and set forth in this Agreement.

“Pledge” and any grammatical variation thereof means, with respect to an interest, asset, or right, any pledge, security interest, hypothecation, deed of trust, lien or other similar encumbrance granted with respect to the affected interest, asset or right to secure payment or performance of an obligation.

“Primary Market Transaction” means any transaction other than a secondary market transaction and refers to any transaction where a Person purchases securities in an offering.

“Prime Rate” means the prime rate published in The Wall Street Journal (or any successor publication) on the last day of each month (or, if not a publication day, the prime rate last published prior to such last day).

“Proceeding” has the meaning set forth in Section 4.8(b).

“Qualified Bid” means a Bid that is deemed by the Selection Committee to include sufficient information regarding the Bidder’s ability to provide the necessary capabilities to create, implement, and maintain the CAT so that such Bid can be effectively evaluated by the Selection Committee. When evaluating whether a Bid is a Qualified Bid, each member of the Selection Committee shall consider whether the Bid adequately addresses the evaluation factors set forth in the RFP, and apply such weighting and priority to the factors as such member of the Selection Committee deems appropriate in his or her professional judgment. The determination of whether a Bid is a Qualified Bid shall be determined pursuant to the process set forth in Section 5.2.

“Qualified Bidder” means a Bidder that has submitted a Qualified Bid.

“Quotation Information” means all bids (as defined under SEC Rule 600(b)(8)), offers (as defined under SEC Rule 600(b)(8)), all bids and offers of OTC Equity Securities, displayed

quotation sizes in Eligible Securities, market center identifiers (including, in the case of FINRA, the FINRA member that is registered as a market maker or electronic communications network or otherwise utilizes the facilities of FINRA pursuant to applicable FINRA rules, that entered the quotation), withdrawals and other information pertaining to quotations in Eligible Securities required to be reported to the Plan Processor pursuant to this Agreement and SEC Rule 613.

“Raw Data” means Participant Data and Industry Member Data that has not been through any validation or otherwise checked by the CAT System.

“Received Industry Member Data” has the meaning set forth in Section 6.4(d)(ii).

“Receiving Party” has the meaning set forth in Section 9.6(a).

“Recorded Industry Member Data” has the meaning set forth in Section 6.4(d)(i).

“Registered Person” means any member, principal, executive, registered representative, or other person registered or required to be registered under a Participant’s rules.

“Reportable Event” includes, but is not limited to, the original receipt or origination, modification, cancellation, routing, execution (in whole or in part) and allocation of an order, and receipt of a routed order.

“Representatives” has the meaning set forth in Section 9.6(a).

“RFP” means the “Consolidated Audit Trail National Market System Plan Request for Proposal” published by the Participants on February 26, 2013 attached as Appendix A, as amended from time to time.

“Securities Information Processor” or “SIP” has the same meaning provided in Section 3(a)(22)(A) of the Exchange Act.

“Selection Committee” means the committee formed pursuant to Section 5.1.

“Selection Plan” has the meaning set forth in Recital A.

“Shortlisted Bid” means a Bid submitted by a Qualified Bidder and selected as a Shortlisted Bid by the Selection Committee pursuant to Section 5.2(b) and, if applicable, pursuant to Section 5.2(c)(iii).

“Shortlisted Bidder” means a Qualified Bidder that has submitted a Bid selected as a Shortlisted Bid.

“SIP Data” has the meaning set forth in Section 6.5(a)(ii).

“SLA” has the meaning set forth in Section 6.1(h).

“Small Industry Member” means an Industry Member that qualifies as a small broker-dealer as defined in SEC Rule 613.

“SRO” means any self-regulatory organization within the meaning of Section 3(a)(26) of the Exchange Act.

“SRO-Assigned Market Participant Identifier” means an identifier assigned to an Industry Member by an SRO or an identifier used by a Participant.

“Subcommittee” has the meaning set forth in Section 4.12(a).

“Supermajority Vote” means the affirmative vote of at least two-thirds of all of the members of the Operating Committee or any Subcommittee, as applicable, authorized to cast a vote with respect to a matter presented for a vote (whether or not such a member is present at any meeting at which a vote is taken) by the Operating Committee or any Subcommittee, as applicable (excluding, for the avoidance of doubt, any member of the Operating Committee or any Subcommittee, as applicable, that is recused or subject to a vote to recuse from such matter pursuant to Section 4.3(d)); provided that if two-thirds of all of such members authorized to cast a vote is not a whole number then that number shall be rounded up to the nearest whole number.

“Tax Matters Partner” has the meaning set forth in Section 9.5(a).

“Transfer” and any grammatical variation thereof means any sale, exchange, issuance, redemption, assignment, distribution or other transfer, disposition or alienation in any way (whether voluntarily, involuntarily or by operation of law). Transfer shall specifically include any: (a) assignment or distribution resulting from bankruptcy, liquidation, or dissolution; or (b) Pledge.

“Technical Specifications” has the meaning set forth in Section 6.9(a).

“Trading Day” shall have such meaning as is determined by the Operating Committee. For the avoidance of doubt, the Operating Committee may establish different Trading Days for NMS Stocks (as defined in SEC Rule 600(b)(47), Listed Options, OTC Equity Securities, and any other securities that are included as Eligible Securities from time to time.

“Voting Senior Officer” has the meaning set forth in Section 5.1(a).

Section 1.2. Principles of Interpretation. In this Agreement (including, for the avoidance of doubt, the Exhibits, Appendices, Attachments, Recitals and Schedules identified in this Agreement), unless the context otherwise requires:

- (a) words denoting the singular include the plural and vice versa;
- (b) words denoting a gender include all genders;
- (c) all exhibits, appendices, attachments, recitals, and schedules to the document in which the reference thereto is contained shall, unless the context otherwise requires, constitute an integral part of such document for all purposes;

(d) a reference to a particular clause, section, article, exhibit, appendix, attachment, recital, or schedule shall be a reference to a clause, section or article of, or an exhibit, appendix, attachment, recital, or schedule to, this Agreement;

(e) a reference to any statute, regulation, amendment, ordinance or law includes all statutes, regulations, proclamations, amendments or laws varying, consolidating or replacing the same from time to time, and a reference to a statute includes all regulations, policies, protocols, codes, proclamations, interpretations and ordinances issued or otherwise applicable under that statute unless, in any such case, otherwise expressly provided in any such statute or in the document in which the reference is contained;

(f) a reference to a “SEC Rule” refers to the correspondingly numbered Rule promulgated under the Exchange Act;

(g) a definition of or reference to any document, instrument or agreement includes an amendment or supplement to, or restatement, replacement, modification or novation of, any such document, instrument or agreement unless otherwise specified in such definition or in the context in which such reference is used;

(h) a reference to any Person includes such Person’s permitted successors and assigns in that designated capacity;

(i) a reference to “\$”, “Dollars” or “US \$” refers to currency of the United States of America;

(j) unless otherwise expressly provided in this Agreement, wherever the consent of any Person is required or permitted herein, such consent may be withheld in such Person’s sole and absolute discretion;

(k) words such as “hereunder”, “hereto”, “hereof” and “herein” and other words of similar import shall refer to the whole of the applicable document and not to any particular article, section, subsection or clause thereof; and

(l) a reference to “including” (and grammatical variations thereof) means “including without limitation” (and grammatical variations thereof).

ARTICLE II

EFFECTIVENESS OF AGREEMENT; ORGANIZATION

Section 2.1. Effectiveness. This Agreement shall become effective upon approval by the Commission and execution by all Participants identified on Exhibit A and shall continue until terminated. Notwithstanding any provision in this Agreement to the contrary and without the consent of any Person being required, the Company’s execution, delivery and performance of this Agreement are hereby authorized, approved and ratified in all respects.

Section 2.2. Formation. The Company was formed as a limited liability company under the Delaware Act by filing a certificate of formation (the “Certificate”) with the Delaware Secretary of State.

Section 2.3. Name. The name of the Company is CONSOLIDATED AUDIT TRAIL, LLC. The name of the Company may be changed at any time or from time to time with the approval of the Operating Committee. All Company business shall be conducted in that name or such other names that comply with applicable law as the Operating Committee may select from time to time.

Section 2.4. Registered Office; Registered Agent; Principal Office; Other Offices. The registered office of the Company required by the Delaware Act to be maintained in the State of Delaware shall be the office of the initial registered agent named in the Certificate or such other office (which need not be a place of business of the Company) as the Operating Committee may designate from time to time in the manner provided by law. The registered agent of the Company in the State of Delaware shall be the initial registered agent named in the Certificate or such other Person or Persons as the Operating Committee may designate from time to time in the manner provided by law. The principal office of the Company shall be at such place as the Operating Committee may designate from time to time, which need not be in the State of Delaware. The Company may have such other offices as the Operating Committee may designate from time to time.

Section 2.5. Certain Filings. The Company shall cause to be filed such certificates and documents as may be necessary or appropriate to comply with the Delaware Act and any other applicable requirements for the organization, continuation and operation of a limited liability company in accordance with the laws of the State of Delaware and any other jurisdiction in which the Company shall conduct business, and shall continue to do so for so long as the Company conducts business therein. Each member of the Operating Committee is hereby designated as an “authorized person” within the meaning of the Delaware Act.

Section 2.6. Purposes and Powers. The Company may engage in: (a) the creation, implementation, and maintenance of the CAT pursuant to SEC Rule 608 and SEC Rule 613; and (b) any other business or activity that now or hereafter may be necessary, incidental, proper, advisable or convenient to accomplish the foregoing purpose and that is not prohibited by the Delaware Act, the Exchange Act or other applicable law and is consistent with tax exempt status under Section 501(c)(6) of the Code. The Company shall have and may exercise all of the powers and rights conferred upon limited liability companies formed pursuant to the Delaware Act.

Section 2.7. Term. The term of the Company commenced on the date the Certificate was filed with the office of the Secretary of State of Delaware, and shall be perpetual unless dissolved as provided in this Agreement.

ARTICLE III
PARTICIPATION

Section 3.1. Participants. The name and address of each Participant are set forth on Exhibit A. New Participants may only be admitted to the Company in accordance with Section 3.5. No Participant shall have the right or power to resign or withdraw from the Company, except: (a) upon a Transfer of record ownership of all of such Participant's Company Interest in compliance with, and subject to, the provisions of Section 3.4; or (b) as permitted by Section 3.6. No Participant may be expelled or required to resign or withdraw from the Company except upon a Transfer of record ownership of all of such Participant's Company Interest in compliance with, and subject to, the provisions of Section 3.4, or as provided by Section 3.7(a)(ii) or Section 3.7(a)(iii).

Section 3.2. Company Interests Generally.

(a) All Company Interests shall have the same rights, powers, preferences and privileges, and shall be subject to the same restrictions, qualifications and limitations. Additional Company Interests may be issued only as permitted by Section 3.3.

(b) Without limiting Section 3.2(a), each Participant shall be entitled to one vote on any matter presented to the Participants for their consideration at any meeting of the Participants (or by written action of the Participants in lieu of a meeting).

(c) Company Interests shall not be evidenced by certificates.

(d) Each Participant shall have an equal Company Interest as each other Participant.

Section 3.3. New Participants.

(a) Any Person approved by the Commission as a national securities exchange or national securities association under the Exchange Act after the Effective Date may become a Participant by submitting to the Company a completed application in the form provided by the Company. As a condition to admission as a Participant, said Person shall: (i) execute a counterpart of this Agreement, at which time Exhibit A shall be amended to reflect the status of said Person as a Participant (including said Person's address for purposes of notices delivered pursuant to this Agreement); and (ii) pay a fee to the Company in an amount determined by a Majority Vote of the Operating Committee as fairly and reasonably compensating the Company and the Participants for costs incurred in creating, implementing, and maintaining the CAT, including such costs incurred in evaluating and selecting the Initial Plan Processor and any subsequent Plan Processor and for costs the Company incurs in providing for the prospective Participant's participation in the Company, including after consideration of the factors identified in Section 3.3(b) (the "Participation Fee"). The amendment to this Agreement reflecting the admission of a new Participant shall be effective only when: (x) it is approved by the Commission in accordance with SEC Rule 608 or otherwise becomes effective pursuant to SEC Rule 608; and (y) the prospective Participant pays the Participation Fee. Neither a prospective Participant nor any Affiliate of such prospective Participant that is already a Participant shall

vote on the determination of the amount of the Participation Fee to be paid by such prospective Participant. Participation Fees paid to the Company shall be added to the general revenues of the Company.

(b) In determining the amount of the Participation Fee to be paid by any prospective Participant, the Operating Committee shall consider the following factors:

(i) the portion of costs previously paid by the Company for the development, expansion and maintenance of the CAT which, under GAAP, would have been treated as capital expenditures and would have been amortized over the five (5) years preceding the admission of the prospective Participant;

(ii) an assessment of costs incurred and to be incurred by the Company for modifying the CAT or any part thereof to accommodate the prospective Participant, which are not otherwise required to be paid or reimbursed by the prospective Participant;

(iii) Participation Fees paid by other Participants admitted as such after the Effective Date;

(iv) elapsed time from the Effective Date to the anticipated date of admittance of the prospective Participant; and

(v) such other reasonable, equitable and not unfairly discriminatory factors, if any, as may be determined to be appropriate by the Operating Committee and approved by the Commission.

In the event the Company (following the vote of the Operating Committee contemplated by Section 3.3(a)) and a prospective Participant do not agree on the amount of the Participation Fee, such amount shall be subject to review by the Commission pursuant to Rule 608 of the Exchange Act.

(c) An applicant for participation in the Company may apply for limited access to the CAT System for planning and testing purposes pending its admission as a Participant by submitting to the Company a completed Application for Limited Access to the CAT System in a form provided by the Company, accompanied by payment of a deposit in the amount established by the Company, which shall be applied or refunded as described in such application. To be eligible to apply for such limited access, the applicant must have been approved by the SEC as a national securities exchange or national securities association under the Exchange Act but the applicant has not yet become a Participant, or the SEC must have published such applicant's Form 1 application or Form X-15AA-1 application to become a national securities exchange or a national securities association, respectively.

Section 3.4. Transfer of Company Interest.

(a) No Participant may Transfer any Company Interest except in compliance with this Section 3.4. Any Transfer or attempted Transfer in contravention of the foregoing sentence or any other provision of this Agreement shall be null and void *ab initio* and ineffective to Transfer any Company Interest and shall not bind or be recognized by or on the books of the

Company, and any transferee in such transaction shall not, to the maximum extent permitted by applicable law, be or be treated as or deemed to be a Participant (or an assignee within the meaning of § 18-702 of the Delaware Act) for any purpose.

(b) No Participant may Transfer any Company Interest except to a national securities exchange or national securities association that succeeds to the business of such Participant as a result of a merger or consolidation with such Participant or the Transfer of all or substantially all of the assets or equity of such Participant.

(c) Notwithstanding anything to the contrary contained in this Agreement, no Participant may Transfer any Company Interest to any transferee as permitted by Section 3.4(b) (a “Permitted Transferee”) unless: (i) such Permitted Transferee executes a counterpart of this Agreement, at which time Exhibit A shall be amended to reflect the status of said Permitted Transferee as a Participant (including said Permitted Transferee’s address for purposes of notices delivered pursuant to this Agreement); and (ii) the amendment to this Agreement reflecting the Transfer of a Company Interest to a Permitted Transferee is approved by the Commission in accordance with SEC Rule 608 or otherwise becomes effective pursuant to SEC Rule 608. Subject to compliance with this Section 3.4, such amendment and such Transfer shall be effective only when it is approved by the SEC in accordance with SEC Rule 608 or otherwise becomes effective pursuant to SEC Rule 608, as applicable.

(d) The Company shall not be required to recognize any Transfer of any Company Interest until the instrument conveying such Company Interest, in form and substance satisfactory to the Company, has been delivered to the Company at its principal office for recordation on the books of the Company and the transferring Participant or Permitted Transferee has paid all costs and expenses of the Company in connection with such Transfer. The Company shall be entitled to treat the record owner of any Company Interest as the absolute owner thereof in all respects, and neither the Company nor any Participant shall incur liability for distributions of cash or other property made in good faith to such owner until such time as the instrument conveying such Company Interest, in form and substance satisfactory to the Company, has been received and accepted by the Company and recorded on the books of the Company.

(e) Notwithstanding anything to the contrary contained in this Agreement, without prior approval thereof by the Operating Committee, no Transfer of any Company Interest shall be made if the Company is advised by its counsel that such Transfer: (i) may not be effected without registration under the Securities Act of 1933; (ii) would result in the violation of any applicable state securities laws; (iii) would require the Company to register as an investment company under the Investment Company Act of 1940 or modify the exemption from such registration upon which the Company has chosen to rely; or (iv) would require the Company to register as an investment adviser under state or federal securities laws.

Section 3.5. Admission of New Participants. Any Person acquiring a Company Interest pursuant to Section 3.3, or any Permitted Transferee acquiring a Participant’s Company Interest pursuant to Section 3.4, shall, unless such acquiring Permitted Transferee is a Participant as of immediately prior to such acquisition, be deemed to have been admitted to the Company as a Participant, automatically and with no further action being necessary by the Operating

Committee, the Participants or any other Person, by virtue of, and upon the consummation of, such acquisition of a Company Interest and compliance with Section 3.3 or Section 3.4, as applicable.

Section 3.6. Voluntary Resignation from Participation. Any Participant may voluntarily resign from the Company, and thereby withdraw from and terminate its right to any Company Interest, only if (a) a Permitted Legal Basis for such action exists and (b) such Participant provides to the Company and each other Participant no less than thirty (30) days prior to the effective date of such action written notice specifying such Permitted Legal Basis, including appropriate documentation evidencing the existence of such Permitted Legal Basis, and, to the extent applicable, evidence reasonably satisfactory to the Company and other Participants that any orders or approvals required from the Commission in connection with such action have been obtained. A validly withdrawing Participant shall have the rights and obligations provided in Section 3.7.

Section 3.7. Termination of Participation.

(a) The participation in the Company of a Participant, and its right to any Company Interest, shall terminate as of the earliest of: (i) the effective date specified in a valid notice delivered pursuant to Section 3.6 (which date, for the avoidance of doubt, shall be no earlier than the date that is thirty (30) days after the delivery of such notice); (ii) such time as such Participant is no longer registered as a national securities exchange or national securities association; or (iii) the date of termination pursuant to Section 3.7(b).

(b) Each Participant shall pay all fees or other amounts required to be paid under this Agreement within thirty (30) days after receipt of an invoice or other notice indicating payment is due (unless a longer payment period is otherwise indicated) (the “Payment Date”). The Participant shall pay interest on the outstanding balance from the Payment Date until such fee or amount is paid at a per annum rate equal to the lesser of: (i) the Prime Rate plus 300 basis points; or (ii) the maximum rate permitted by applicable law. If any such remaining outstanding balance is not paid within thirty (30) days after the Payment Date, the Participants shall file an amendment to this Agreement requesting the termination of the participation in the Company of such Participant, and its right to any Company Interest, with the SEC. Such amendment shall be effective only when it is approved by the SEC in accordance with SEC Rule 608 or otherwise becomes effective pursuant to SEC Rule 608.

(c) In the event a Participant becomes subject to one or more of the events of bankruptcy enumerated in § 18-304 of the Delaware Act, that event by itself shall not cause the termination of the participation in the Company of the Participant so long as the Participant continues to be registered as a national securities exchange or national securities association. A terminated Participant shall remain liable for its proportionate share of costs and expenses allocated to it for the period during which it was a Participant, for obligations under Section 3.8(c), for its indemnification obligations pursuant to Section 4.1, and for obligations under Section 9.6, but it shall have no other obligations under this Agreement following the effective date of termination. This Agreement shall be amended to reflect any termination of participation in the Company of a Participant pursuant to this Section 3.7; provided that such amendment shall

be effective only when it is approved by the Commission in accordance with SEC Rule 608 or otherwise becomes effective pursuant to SEC Rule 608.

Section 3.8. Obligations and Liability of Participants.

(a) Except as may be determined by the unanimous vote of all the Participants or as may be required by applicable law, no Participant shall be obligated to contribute capital or make loans to the Company. No Participant shall have the right to withdraw or to be repaid any capital contributed by it or to receive any other payment in respect of any Company Interest, including as a result of the withdrawal or resignation of such Participant from the Company, except as specifically provided in this Agreement.

(b) Except as provided in this Agreement and except as otherwise required by applicable law, no Participant shall have any personal liability whatsoever in its capacity as a Participant, whether to the Company, to any Participant or any Affiliate of any Participant, to the creditors of the Company or to any other Person, for the debts, liabilities, commitments or any other obligations of the Company or for any losses of the Company. Without limiting the foregoing, the failure of the Company to observe any formalities or requirements relating to exercise of its powers or management of its business or affairs under this Agreement or the Delaware Act shall not be grounds for imposing personal liability on any Participant or any Affiliate of a Participant for any liability of the Company.

(c) In accordance with the Delaware Act, a member of a limited liability company may, under certain circumstances, be required to return amounts previously distributed to such member. It is the intent of the Participants that no distribution to any Participant shall be deemed a return of money or other property paid or distributed in violation of the Delaware Act. The payment of any such money or distribution of any such property to a Participant shall be deemed to be a compromise within the meaning of the Delaware Act, and the Participant receiving any such money or property shall not be required to return any such money or property to any Person. However, if any court of competent jurisdiction holds that, notwithstanding the provisions of this Agreement, any Participant is obligated to make any such payment, such obligation shall be the obligation of such Participant and not of the Operating Committee, the Company or any other Participant.

Section 3.9. Loans. If the Company requires additional funds to carry out its purposes, to conduct its business, to meet its obligations, or to make any expenditure authorized by this Agreement, the Company may borrow funds from such one or more of the Participants, or from such third party lender(s), and on such terms and conditions, as may be approved by a Supermajority Vote of the Operating Committee.

Section 3.10. No Partnership. The Company is not intended to be a general partnership, limited partnership or joint venture for any purpose, and no Participant shall be considered to be a partner or joint venturer of any other Participant, for any purpose, and this Agreement shall not be construed to suggest otherwise.

Section 3.11. Compliance Undertaking. Each Participant shall comply with and enforce compliance, as required by SEC Rule 608(c), by its Industry Members with the

provisions of SEC Rule 613 and of this Agreement, as applicable, to the Participant and its Industry Members. The Participants shall endeavor to promulgate consistent rules (after taking into account circumstances and considerations that may impact Participants differently) requiring compliance by their respective Industry Members with the provisions of SEC Rule 613 and this Agreement.

ARTICLE IV

MANAGEMENT OF THE COMPANY

Section 4.1. Operating Committee. Except for situations in which the approval of the Participants is required by this Agreement or by non-waivable provisions of applicable law, the Company shall be managed by the Operating Committee, which shall have general charge and supervision of the business of the Company and shall be constituted as provided in Section 4.2. The Operating Committee: (a) acting collectively in accordance with this Agreement, shall be the sole “manager” of the Company within the meaning of § 18-101(10) of the Delaware Act (and no individual member of the Operating Committee shall (i) be a “manager” of the Company within the meaning of Section 18-101(10) of the Delaware Act or (ii) have any right, power or authority to act for or on behalf of the Company, to do any act that would be binding on the Company, or to incur any expenditures on behalf of the Company); (b) shall have the right, power and authority to exercise all of the powers of the Company except as otherwise provided by applicable law or this Agreement; and (c) except as otherwise expressly provided herein, shall make all decisions and authorize or otherwise approve all actions taken or to be taken by the Company. Decisions or actions relating to the Company that are made or approved by the Operating Committee, or by any Subcommittee within the scope of authority granted to such Subcommittee in accordance with this Agreement (or, with respect to matters requiring a vote, approval, consent or other action of the Participants hereunder or pursuant to non-waivable provisions of applicable law, by the Participants) in accordance with this Agreement shall constitute decisions or actions by the Company and shall be binding on the Company and each Participant. Except to the extent otherwise expressly provided to the contrary in this Agreement, no Participant shall have authority to act for, or to assume any obligation or responsibility on behalf of, the Company, without the prior approval of the Operating Committee, and each Participant shall indemnify and hold harmless the Company and each other Participant for any breach of the provisions of this sentence by such breaching Participant. Without limiting the generality of the foregoing, except as otherwise expressly provided in this Agreement, the Operating Committee shall make all policy decisions on behalf of the Company in furtherance of the functions and objectives of the Company under the Exchange Act, any rules thereunder, including SEC Rule 613, and under this Agreement. Notwithstanding anything to the contrary, the Operating Committee may delegate all or part of its administrative functions under this Agreement, but not its policy making (except to the extent determinations are delegated as specifically set forth in this Agreement) authority, to one or more Subcommittees, and any other Person. A Person to which administrative functions are so delegated shall perform the same as agent for the Company, in the name of the Company. Each Person who performs administrative functions on behalf of the Company (including the Plan Processor) shall be required to: (i) agree to be bound by the confidentiality obligations in Section 9.6(a) as a “Receiving Party”; and (ii) agree that any nonpublic business information pertaining to any Participant or any Affiliate of such Participant that becomes known to such Person shall be held in confidence and not shared

with the other Participants or any other Person, except for information that may be shared in connection with joint activities permitted under this Agreement.

Section 4.2. Composition and Selection of Operating Committee; Chair.

(a) The Operating Committee shall consist of one voting member representing each Participant and one alternate voting member representing each Participant who shall have a right to vote only in the absence of that Participant's voting member of the Operating Committee. Each of the voting and alternate voting members of the Operating Committee shall be appointed by the Participant that he or she represents, shall serve at the will of the Participant appointing such member and shall be subject to the confidentiality obligations of the Participant that he or she represents as set forth in Section 9.6. One individual may serve as the voting member of the Operating Committee for multiple Affiliated Participants, and such individual shall have the right to vote on behalf of each such Affiliated Participant.

(b) No later than the date the CAT System commences operations, the Operating Committee shall elect, by Majority Vote, one member thereof to act as the initial chair of the Operating Committee (the "Chair"). Such initial Chair, and each successor thereto, shall serve in such capacity for a two (2)-year term or until the earliest of his death, resignation or removal in accordance with the provisions of this Agreement. The Operating Committee shall elect, from the members thereof, a successor to the then serving Chair (which successor, subject to the last sentence of this Section 4.2(b), may be the Person then serving in such capacity) no later than three (3) months prior to the expiration of the then current term of the Person then serving as Chair. The Operating Committee, by Supermajority Vote, may remove the Chair from such position. In the case of any death, removal, resignation, or other vacancy of the Chair, a successor Chair shall be promptly elected by the Operating Committee, by Majority Vote, from among the members thereof who shall serve until the end of the then current term. The Chair shall preside at all meetings of the Operating Committee, shall designate a Person to act as Secretary to record the minutes of each such meeting, and shall perform such other duties and possess such other powers as the Operating Committee may from time to time prescribe. The Chair shall not be entitled to a tie-breaking vote at any meeting of the Operating Committee. Notwithstanding anything in this Agreement to the contrary: (i) no Person shall serve as Chair for more than two successive full terms; and (ii) no Person then appointed to the Operating Committee by a Participant that then serves, or whose Affiliate then serves, as the Plan Processor shall be eligible to serve as the Chair.

Section 4.3. Action of Operating Committee.

(a) Except as otherwise provided herein, each of the members of the Operating Committee, including the Chair, shall be authorized to cast one (1) vote for each Participant that he or she represents on all matters voted upon by the Operating Committee, and action of the Operating Committee shall be authorized by Majority Vote, subject to the approval of the SEC whenever such approval is required under applicable provisions of the Exchange Act and the rules of the SEC adopted thereunder. Action of the Operating Committee authorized in accordance with this Agreement shall be without prejudice to the rights of any Participant to present contrary views to any regulatory body or in any other appropriate forum. Without

limiting the generality of the foregoing, the Company shall not take any of the following actions unless the Operating Committee, by Majority Vote, authorizes such action:

- (i) select the Chair pursuant to Section 4.2(b);
- (ii) select the members of the Advisory Committee pursuant to Section 4.13;
- (iii) interpret this Agreement (unless otherwise noted herein);
- (iv) approve any recommendation by the Chief Compliance Officer pursuant to Section 6.2(a)(v)(A);
- (v) determine to hold an Executive Session of the Operating Committee pursuant to Section 4.4(a);
- (vi) determine the appropriate funding-related policies, procedures and practices consistent with Article XI; or
- (vii) any other matter specified elsewhere in this Agreement (which includes, as stated in the definition of “Agreement,” the Appendices to this Agreement) as requiring a vote, approval or other action of the Operating Committee (other than those matters expressly requiring a Supermajority Vote or a different vote of the Operating Committee).

(b) Notwithstanding Section 4.3(a) or anything else to the contrary in this Agreement, the Company shall not take any of the following actions unless such action shall have been authorized by the Supermajority Vote of the Operating Committee, subject to the approval of the SEC whenever such approval is required under applicable provisions of the Exchange Act and the rules of the SEC adopted thereunder:

- (i) select a Plan Processor, other than the Initial Plan Processor selected in accordance with Article V;
- (ii) terminate a Plan Processor without cause in accordance with Section 6.1(q);
- (iii) approve the Plan Processor’s appointment or removal of the Chief Information Security Officer, the Chief Compliance Officer, or any Independent Auditor in accordance with Section 6.1(b);
- (iv) enter into, modify or terminate any Material Contract (if the Material Contract is with a Participant or an Affiliate of a Participant, such Participant and Affiliated Participant shall be recused from any vote under this Section 4.3(b)(iv));
- (v) make any Material Systems Change;

(vi) approve the initial Technical Specifications pursuant to Section 6.9 or any Material Amendment to the Technical Specifications proposed by the Plan Processor in accordance with Section 6.9;

(vii) amend the Technical Specifications on its own motion; or

(viii) any other matter specified elsewhere in this Agreement (which includes, as stated in the definition of “Agreement,” the Appendices to this Agreement) as requiring a vote, approval or other action of the Operating Committee by a Supermajority Vote.

(c) Any action required or permitted to be taken at any meeting of the Operating Committee or any Subcommittee may be taken without a meeting, if all of the members of the Operating Committee or Subcommittee, as the case may be, then serving consent to the action in writing or by electronic transmission. Such written consents and hard copies of the electronic transmissions shall be filed with the minutes of proceedings of the Operating Committee or Subcommittee, as applicable.

(d) If a member of the Operating Committee or any Subcommittee determines that voting on a matter under consideration by the Operating Committee or such Subcommittee raises a Conflict of Interest, such member shall recuse himself or herself from voting on such matter. If the members of the Operating Committee or any Subcommittee (excluding the member thereof proposed to be recused) determine by Supermajority Vote that any member voting on a matter under consideration by the Operating Committee or such Subcommittee raises a Conflict of Interest, such member shall be recused from voting on such matter. No member of the Operating Committee or any Subcommittee shall be automatically recused from voting on any matter, except as provided in Section 4.3(b)(iv) or as otherwise specified elsewhere in this Agreement, and except as provided below:

(i) if a Participant is a Bidding Participant whose Bid remains under consideration, members appointed to the Operating Committee or any Subcommittee by such Participant or any of its Affiliated Participants shall be recused from any vote concerning: (A) whether another Bidder may revise its Bid; (B) the selection of a Bidder; or (C) any contract to which such Participant or any of its Affiliates would be a party in its capacity as Plan Processor; and

(ii) if a Participant is (A) then serving as Plan Processor, (B) is an Affiliate of the Person then serving as Plan Processor, or (C) is an Affiliate of an entity that is a Material Subcontractor to the Plan Processor, then in each case members appointed to the Operating Committee or any Subcommittee by such Participant or any of its Affiliated Participants shall be recused from any vote concerning: (1) the proposed removal of such Plan Processor; or (2) any contract between the Company and such Plan Processor.

Section 4.4. Meetings of the Operating Committee.

(a) Meetings of the Operating Committee may be attended by each Participant’s voting Representative and its alternate voting Representative and by a maximum of two (2) nonvoting Representatives of each Participant, by members of the Advisory Committee, by the Chief Compliance Officer, by other Representatives of the Company and the Plan

Processor, by Representatives of the SEC, and by such other Persons that the Operating Committee may invite to attend; provided that the Operating Committee may, where appropriate, determine to meet in an Executive Session, during which only voting members of the Operating Committee and Representatives of the SEC shall be present; provided, that the Operating Committee may invite other Representatives of the Participants, of the Company, of the Plan Processor (including the Chief Compliance Officer and the Chief Information Security Officer), or such other Persons that the Operating Committee may invite to attend, to be present during an Executive Session. Any determination of the Operating Committee to meet in an Executive Session shall be made upon a Majority Vote and shall be reflected in the minutes of the meeting. Regular meetings of the Operating Committee shall be held not less than once each calendar quarter at such times as shall from time to time be determined by the Operating Committee, on not less than ten (10) days' notice. Special meetings of the Operating Committee may be called upon the request of two or more Participants on not less than two (2) days' notice; provided that each Participant, collectively with all of such Participant's Affiliated Participants, shall be deemed a single Participant for purposes of this sentence. Emergency meetings of the Operating Committee may be called upon the request of two (2) or more Participants and may occur as soon as practical after calling for such meeting; provided that each Participant, collectively with all of such Participant's Affiliated Participants, shall be deemed a single Participant for purposes of this sentence. In the case of an emergency meeting of the Operating Committee, in addition to those Persons otherwise entitled to attend such meeting: (i) each Participant shall have the right to designate a reasonable number of its employees or other Representatives with substantial knowledge or expertise relevant to the subject matter of such meeting to attend such meeting; and (ii) each Participant shall use commercially reasonable efforts to designate an employee or other Representative of such Participant with substantial knowledge or expertise relevant to the subject matter of such meeting to attend such meeting; provided, for the avoidance of doubt, that no Person attending any such meeting solely by virtue of this sentence shall have the right to vote on any matter submitted for a vote at any such meeting. The Chair, or in his or her absence, a member of the Operating Committee designated by the Chair or by members of the Operating Committee in attendance, shall preside at each meeting of the Operating Committee, and a Person in attendance designated by the Chair (or the member of the Operating Committee presiding in the Chair's absence) shall act as Secretary to record the minutes thereof. The location of the regular and special meetings of the Operating Committee shall be fixed by the Operating Committee, provided that in general the location of meetings shall be rotated among the locations of the principal offices of the Participants. Members of the Operating Committee may be present at a meeting by conference telephone or other electronic means that enables each of them to hear and be heard by all others present at the meeting. Whenever notice of any meeting of the Operating Committee is required to be given by law or this Agreement, a written waiver, signed by the Person entitled to notice, or a waiver by electronic transmission by the Person entitled to notice, whether before, at or after the time stated in such notice, shall be deemed equivalent to notice. Attendance at a meeting of the Operating Committee by a member thereof shall constitute a waiver of notice of such meeting, except when such member of the Operating Committee attends any such meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

(b) Any Person that is not a Participant, but for which the SEC has published a Form 1 Application or Form X-15AA-1 Application to become a national securities exchange

or a national securities association, respectively, shall be permitted to appoint one primary Representative and one alternate Representative to attend regularly scheduled Operating Committee meetings in the capacity of a non-voting observer but shall not be permitted to have any Representative attend a special meeting, emergency meeting or meeting held in Executive Session of the Operating Committee. If such Person's Form 1 Application or Form X-15AA-1 Application is withdrawn or returned for any reason, then such Person shall no longer be eligible to be represented in regularly scheduled Operating Committee meetings. The Operating Committee shall have the discretion, in limited instances, to deviate from this policy if it determines, by Majority Vote, that circumstances so warrant; provided, however, that the exercise of such discretion is reasonable and does not impose any unnecessary or inappropriate burden on competition.

Section 4.5. Interpretation of Other Regulations. Interpretive questions arising during the operation or maintenance of the Central Repository with respect to applicable laws, rules or regulations shall be presented to the Operating Committee, which shall determine whether to seek interpretive guidance from the SEC or other appropriate regulatory body and, if so, in what form.

Section 4.6. Officers of the Company.

(a) Each of the Chief Compliance Officer and the Chief Information Security Officer (each of whom shall be employed solely by the Plan Processor and neither of whom shall be deemed or construed in any way to be an employee of the Company) shall be an Officer with the same respective title, as applicable, as the Chief Compliance Officer of the Company and the Chief Information Security Officer of the Company. Neither such Officer shall receive or be entitled to any compensation from the Company or any Participant by virtue of his or her service in such capacity (other than, if a Participant is then serving as the Plan Processor, compensation paid to such Officer as an employee of such Participant). Each such Officer shall report directly to the Operating Committee. The Chief Compliance Officer shall work on a regular and frequent basis with the Compliance Subcommittee and/or other Subcommittees as may be determined by the Operating Committee. Except to the extent otherwise provided herein, including Section 6.2, each such Officer shall have such fiduciary and other duties with regard to the Plan Processor as imposed by the Plan Processor on such individual by virtue of his or her employment by the Plan Processor. Notwithstanding the foregoing, the Company shall require the Plan Processor, in a written agreement with the Company, to acknowledge that the Officers of the Company owe fiduciary duties to the Company (set forth in Section 4.7(c) of this Agreement), and that, to the extent that the duties owed to the Company by the Officers of the Company, including the Chief Compliance Officer or Chief Information Security Officer, conflict with any duties owed to the Plan Processor, the duties to the Company will control.

(b) The Plan Processor shall inform the Operating Committee of the individual who has direct management responsibility for the Plan Processor's performance of its obligations with respect to the CAT. Subject to approval by the Operating Committee of such individual, the Operating Committee shall appoint such individual as an Officer. In addition, the Operating Committee by Supermajority Vote may appoint other Officers as it shall from time to time deem necessary, and may assign any title to any such Officer as it deems appropriate. Any Officer appointed pursuant to this Section 4.6(b) shall have only such duties and responsibilities

as set forth in this Agreement or as the Operating Committee shall from time to time expressly determine, but no such Officer shall have any authority to bind the Company (which authority is vested solely in the Operating Committee) or be an employee of the Company, unless in each case the Operating Committee, by Supermajority Vote, expressly determines otherwise. No person subject to a “statutory disqualification” (as defined in Section 3(a)(39) of the Exchange Act) may serve as an Officer. It is the intent of the Participants that the Company have no employees.

Section 4.7. Interpretation of Certain Rights and Duties of Participants, Members of the Operating Committee and Officers. To the fullest extent permitted by the Delaware Act and other applicable law:

(a) the respective obligations of the Participants, Officers, and the members of the Operating Committee, to each other and to the Company are limited to the express obligations set forth in this Agreement;

(b) the Participants hereby expressly acknowledge and agree that each member of the Operating Committee, individually, is serving hereunder solely as, and shall act in all respects hereunder solely as, an agent of the Participant appointing such member of the Operating Committee;

(c) no Participant or member of the Operating Committee, in such Person’s capacity as such, shall have any fiduciary or similar duties or obligations to the Company or any other Participant or member of the Operating Committee, whether express or implied by the Delaware Act or any other law, in each case subject only to the implied contractual covenant of good faith and fair dealing, and each Participant and the Company, to the fullest extent permitted by applicable law, waives any claim or cause of action against any Participant or member of the Operating Committee that might otherwise arise in respect of any such fiduciary duty or similar duty or obligation; provided, however, that the provisions of this Section 4.7(c) shall have no effect on the terms of any relationship, agreement or arrangement between any member of the Operating Committee and the Participant appointing such member of the Operating Committee or between any Participant (other than solely in its capacity as a Participant) and the Company such as a contract between such Participant and the Company pursuant to which such Participant serves as the Plan Processor. Each Officer shall have the same fiduciary duties and obligations to the Company as a comparable officer of a Delaware corporation and in all cases shall conduct the business of the Company and execute his or her duties and obligations in good faith and in the manner that the Officer reasonably believes to be in the best interests of the Company;

(d) subject to Section 4.7(c), each Participant and each member of the Operating Committee may, with respect to any vote, consent or approval that such Person is entitled to grant or withhold pursuant to this Agreement, grant or withhold such vote, consent or approval in its sole and absolute discretion, with or without cause; and

(e) for the avoidance of doubt, no Participant shall be entitled to appraisal or dissenter rights for any reason with respect to any Company Interest.

Section 4.8. Exculpation and Indemnification.

(a) Except for the indemnification obligations of Participants under Section 4.1, no Participant or member of the Operating Committee shall be liable to the Company or to any Participant for any loss suffered by the Company or by any other Participant unless such loss is caused by: (i) the fraud, gross negligence, willful misconduct or willful violation of law on the part of such Participant or member of the Operating Committee; or (ii) in the case of a Participant, a material breach of this Agreement by such Participant. The provisions of this Section 4.8(a) shall have no effect on the terms of any relationship, agreement or arrangement between any member of the Operating Committee and the Participant appointing such member to the Operating Committee or between any Participant (other than solely in its capacity as a Participant) and the Company such as a contract between such Participant and the Company pursuant to which such Participant serves as the Plan Processor.

(b) Subject to the limitations and conditions as provided in this Section 4.8(b), the Company shall indemnify any Participant and any member of the Operating Committee (and may, upon approval of the Operating Committee, indemnify any employee or agent of the Company) who was or is made a party or is threatened to be made a party to or is involved in any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative, arbitral (hereinafter a “Proceeding”), or any appeal in such a Proceeding or any inquiry or investigation that could lead to such a Proceeding, by reason of the fact that such Person is or was a Participant, a member of the Operating Committee or any Subcommittee, or an employee or agent of the Company against judgments, penalties (including excise and similar taxes and punitive damages), fines, settlements and reasonable expenses (including attorneys’ fees) actually incurred by such Person in connection with such Proceeding, if and only if the Person seeking indemnification is entitled to exculpation pursuant to Section 4.8(a). Indemnification under this Section 4.8(b) shall continue as to a Person who has ceased to serve in the capacity which initially entitled such Person to indemnification hereunder. As a condition precedent to an indemnified Person’s right to be indemnified pursuant to this Section 4.8(b), such indemnified Person must notify the Company in writing as soon as practicable of any Proceeding for which such indemnified Person will or could seek indemnification. With respect to any Proceeding of which the Company is so notified, the Company shall be entitled to participate therein at its own expense and/or to assume the defense thereof at its own expense, with legal counsel reasonably acceptable to the indemnified Person. If the Company does not assume the defense of any such Proceeding of which the Company receives notice under this Section 4.8(b), reasonable expenses incurred by an indemnified Person in connection with any such Proceeding shall be paid or reimbursed by the Company in advance of the final disposition of such Proceeding upon receipt by the Company of: (i) written affirmation by the indemnified Person of such Person’s good faith belief that such Person has met the standard of conduct necessary for such Person to be entitled to indemnification by the Company (which, in the case of a Person other than a Participant or a member of the Operating Committee, shall be, unless otherwise determined by the Operating Committee, that (A) such Person determined, in good faith, that such conduct was in, or was not opposed to, the best interests of the Company and (B) such conduct did not constitute gross negligence or willful misconduct); and (ii) a written undertaking by such Person to repay such expenses if it shall ultimately be determined by a court of competent jurisdiction that such Person has not met such standard of conduct or is otherwise not entitled to indemnification by the Company. The Company shall not indemnify an indemnified

Person to the extent such Person is reimbursed from the proceeds of insurance, and in the event the Company makes any indemnification payments to an indemnified Person and such Person is subsequently reimbursed from the proceeds of insurance, such Person shall promptly refund such indemnification payments to the Company to the extent of such insurance reimbursement. The rights granted pursuant to this Section 4.8(b) shall be deemed contract rights, and no amendment, modification or repeal of this Section 4.8(b) shall have the effect of limiting or denying any such rights with respect to actions taken or Proceedings arising prior to any amendment, modification or repeal. It is expressly acknowledged that the indemnification provided in this Section 4.8(b) could involve indemnification for negligence or under theories of strict liability. For Persons other than Participants or members of the Operating Committee, indemnification shall only be made upon the approval of the Operating Committee. Notwithstanding anything to the contrary in this Section 4.8 or elsewhere in this Agreement, no Person shall be indemnified hereunder for any losses, liabilities or expenses arising from or out of a violation of federal or state securities laws or any other intentional or criminal wrongdoing. Any indemnification under this Section 4.8 shall be paid from, and only to the extent of, Company assets, and no Participant shall have any personal liability on account thereof in the absence of a separate written agreement to the contrary.

Section 4.9. Freedom of Action. Each Participant and such Participant's Affiliates, and their respective Representatives (individually, "Permitted Person" and collectively, the "Permitted Persons") may have other business interests and may engage in any business or trade, profession, employment, or activity whatsoever (regardless of whether any such activity competes, directly or indirectly, with the Company's business or activities), for its own account, or in partnership with, or as a Representative of, any other Person. No Permitted Person (other than, if a Participant is then serving as the Plan Processor, any Officer then employed by the Plan Processor) shall be required to devote its entire time (business or otherwise), or any particular portion of its time (business or otherwise) to the business of the Company. Neither the Company nor any Participant nor any Affiliate thereof, by virtue of this Agreement, shall have any rights in and to any such independent venture or the income or profits derived therefrom, regardless of whether or not such venture was initially presented to a Permitted Person as a direct or indirect result of such Permitted Person's relationship with the Company. No Permitted Person shall have any obligation hereunder to present any business opportunity to the Company, even if the opportunity is one that the Company might reasonably have pursued or had the ability or desire to pursue, in each case, if granted the opportunity to do so, and no Permitted Person shall be liable to the Company or any Participant (or any Affiliate thereof) for breach of any fiduciary or other duty relating to the Company (whether imposed by applicable law or otherwise), by reason of the fact that the Permitted Person pursues or acquires such business opportunity, directs such business opportunity to another Person or fails to present such business opportunity, or information regarding such business opportunity, to the Company. Each Participant and the Company, to the fullest extent permitted by applicable law, waives any claim or cause of action against any Permitted Person for breach of any fiduciary duty or other duty (contractual or otherwise) by reason of the fact that the Permitted Person pursues or acquires any opportunity for itself, directs such opportunity to another Person, or does not present such opportunity to the Company. This Section 4.9 shall have no effect on the terms of any relationship, agreement or arrangement between any Participant (other than solely in its capacity as a Participant) and the Company such as a contract between such Participant and the Company pursuant to which such Participant serves as the Plan Processor.

Section 4.10. Arrangements with Participants and Members of the Operating Committee. Subject to the terms of this Agreement, including Section 4.3(b)(iv) and Section 4.3(d), and any limitations imposed on the Company and the Participants under applicable law, rules, or regulations, the Company may engage in business with, or enter into one or more agreements, leases, contracts or other arrangements for the furnishing to or by it of goods, services, technology or space with, any Participant, any member of the Operating Committee or any Affiliate of any Participant or member of the Operating Committee, and may pay compensation in connection with such business, goods, services, technology or space.

Section 4.11. Participant Action Without a Meeting. Any action required or permitted to be taken by Participants pursuant to this Agreement (including pursuant to any provision of this Agreement that requires the consent or approval of Participants) may be taken without a meeting, by unanimous consent in writing, setting forth the action so taken, which consent shall be signed by all Participants entitled to consent.

Section 4.12. Subcommittees.

(a) The Operating Committee may, by Majority Vote, designate by resolution one (1) or more subcommittees (each, a “Subcommittee”) it deems necessary or desirable in furtherance of the management of the business and affairs of the Company. For any Subcommittee, any member of the Operating Committee who wants to serve thereon may so serve, and if Affiliated Participants have collectively appointed one member to the Operating Committee to represent them, then such Affiliated Participants may have only that member serve on the Subcommittee or may decide not to have only that collectively appointed member serve on the Subcommittee. Such member may designate an individual other than himself or herself who is also an employee of the Participant or Affiliated Participants that appointed such member to serve on a Subcommittee in lieu of the particular member. Any Subcommittee, to the extent provided in the resolution of the Operating Committee designating it and subject to Section 4.1 and non-waivable provisions of the Delaware Act, shall have and may exercise all the powers and authority of the Operating Committee in the management of the business and affairs of the Company as so specified in the resolution of the Operating Committee. Each Subcommittee shall keep minutes and make such reports as the Operating Committee may from time to time request. Except as the Operating Committee may otherwise determine, any Subcommittee may make rules for the conduct of its business, but unless otherwise provided by the Operating Committee or in such rules, its business shall be conducted as nearly as possible in the same manner as is provided in this Agreement for the Operating Committee.

(b) The Operating Committee shall maintain a compliance Subcommittee (the “Compliance Subcommittee”). The Compliance Subcommittee’s purpose shall be to aid the Chief Compliance Officer (who shall directly report to the Operating Committee in accordance with Section 6.2(a)(iii)) as necessary, including with respect to issues involving:

(i) the maintenance of the confidentiality of information submitted to the Plan Processor or Central Repository pursuant to SEC Rule 613, applicable law, or this Agreement by Participants and Industry Members;

(ii) the timeliness, accuracy, and completeness of information submitted pursuant to SEC Rule 613, applicable law, or this Agreement by Participants and Industry Members; and

(iii) the manner in and extent to which each Participant is meeting its obligations under SEC Rule 613, Section 3.11, and as set forth elsewhere in this Agreement and ensuring the consistency of this Agreement's enforcement as to all Participants.

Section 4.13. Advisory Committee.

(a) An advisory committee to the Company (the "Advisory Committee") shall be formed and shall function in accordance with SEC Rule 613(b)(7) and this Section 4.13.

(b) No member of the Advisory Committee may be employed by or affiliated with any Participant or any of its Affiliates or facilities. A Representative of the SEC shall serve as an observer of the Advisory Committee (but shall not be a member thereof). The Operating Committee shall select one (1) member to serve on the Advisory Committee from representatives of each category identified in Sections 4.13(b)(i) through 4.13(b)(xii) to serve on the Advisory Committee on behalf of himself or herself individually and not on behalf of the entity for which the individual is then currently employed; provided that the members so selected pursuant to Sections 4.13(b)(i) through 4.13(b)(xii) must include, in the aggregate, representatives of no fewer than three (3) broker-dealers that are active in the options business and representatives of no fewer than three (3) broker-dealers that are active in the equities business; and provided further that upon a change in employment of any such member so selected pursuant to Sections 4.13(b)(i) through 4.13(b)(xii) a Majority Vote of the Operating Committee shall be required for such member to be eligible to continue to serve on the Advisory Committee:

- (i) a broker-dealer with no more than 150 Registered Persons;
- (ii) a broker-dealer with at least 151 and no more than 499 Registered Persons;
- (iii) a broker-dealer with 500 or more Registered Persons;
- (iv) a broker-dealer with a substantial wholesale customer base;
- (v) a broker-dealer that is approved by a national securities exchange (A) to effect transactions on an exchange as a specialist, market maker, or floor broker; or (B) to act as an institutional broker on an exchange;
- (vi) a proprietary-trading broker-dealer;
- (vii) a clearing firm;
- (viii) an individual who maintains a securities account with a registered broker or dealer but who otherwise has no material business relationship with a broker or dealer or with a Participant;

- (ix) a member of academia who is a financial economist;
 - (x) three institutional investors, including an individual trading on behalf of an investment company or group of investment companies registered pursuant to the Investment Company Act of 1940;
 - (xi) an individual with significant and reputable regulatory expertise;
- and
- (xii) a service bureau that provides reporting services to one or more CAT Reporters.

(c) Four of the fourteen initial members of the Advisory Committee, as determined by the Operating Committee, shall have an initial term of one (1) year. Five of the fourteen initial members of the Advisory Committee, as determined by the Operating Committee, shall have an initial term of two (2) years. All other members of the Advisory Committee shall have a term of three (3) years. No member of the Advisory Committee may serve thereon for more than two consecutive terms.

(d) The Advisory Committee shall advise the Participants on the implementation, operation, and administration of the Central Repository, including possible expansion of the Central Repository to other securities and other types of transactions. Members of the Advisory Committee shall have the right to attend meetings of the Operating Committee or any Subcommittee, to receive information concerning the operation of the Central Repository (subject to Section 4.13(e)), and to submit their views to the Operating Committee or any Subcommittee on matters pursuant to this Agreement prior to a decision by the Operating Committee on such matters; provided that members of the Advisory Committee shall have no right to vote on any matter considered by the Operating Committee or any Subcommittee and that the Operating Committee or any Subcommittee may meet in Executive Session if, by Majority Vote, the Operating Committee or Subcommittee determines that such an Executive Session is advisable. The Advisory Committee may provide the Operating Committee with recommendations of one or more candidates for the Operating Committee to consider when selecting members of the Advisory Committee pursuant to Section 4.3(a)(ii); provided, however, that the Operating Committee, at its sole discretion, will select the members of the Advisory Committee pursuant to Section 4.3(a)(ii) from the candidates recommended to the Operating Committee by the Advisory Committee, the Operating Committee itself, Participants or other persons. The Operating Committee may solicit and consider views on the operation of the Central Repository in addition to those of the Advisory Committee.

(e) Members of the Advisory Committee shall receive the same information concerning the operation of the Central Repository as the Operating Committee; provided, however, that the Operating Committee may withhold information it reasonably determines requires confidential treatment. Any information received by members of the Advisory Committee in furtherance of the performance of their functions pursuant to this Agreement shall remain confidential unless otherwise specified by the Operating Committee.

ARTICLE V

INITIAL PLAN PROCESSOR SELECTION

Section 5.1. Selection Committee. The Participants shall establish a Selection Committee in accordance with this Article V to evaluate and review Bids and select the Initial Plan Processor.

(a) Composition. Each Participant shall select from its staff one (1) senior officer (“Voting Senior Officer”) to represent the Participant as a member of the Selection Committee. In the case of Affiliated Participants, one (1) individual may be (but is not required to be) the Voting Senior Officer for more than one or all of the Affiliated Participants. Where one (1) individual serves as the Voting Senior Officer for more than one Affiliated Participant, such individual shall have the right to vote on behalf of each such Affiliated Participant.

(b) Voting.

(i) Unless recused pursuant to Sections 5.1(b)(ii), 5.1(b)(iii), or 5.1(b)(iv), each Participant shall have one vote on all matters considered by the Selection Committee.

(ii) No Bidding Participant shall vote on whether a Shortlisted Bidder shall be permitted to revise its Bid pursuant to Section 5.2(c)(ii) or 5.2(d)(i) below if a Bid submitted by or including the Participant or an Affiliate of the Participant is a Shortlisted Bid.

(iii) No Bidding Participant shall vote in the process narrowing the set of Shortlisted Bidders as set forth in Section 5.2(c)(iii) if a Bid submitted by or including the Participant or an Affiliate of the Participant is a Shortlisted Bid.

(iv) No Bidding Participant shall vote in any round if a Bid submitted by or including the Participant or an Affiliate of the Participant is a part of such round.

(v) All votes by the Selection Committee shall be confidential and non-public. All such votes shall be tabulated by an independent third party approved by the Operating Committee, and a Participant’s individual votes shall not be disclosed to other Participants or to the public.

(c) Quorum.

(i) Any action requiring a vote by the Selection Committee can only be taken at a meeting in which all Participants entitled to vote are present. Meetings of the Selection Committee shall be held as needed at such times and locations as shall from time to time be determined by the Selection Committee. Meetings may be held by conference telephone or other acceptable electronic means if all Participants entitled to vote consent thereto in writing or by other means the Selection Committee deems acceptable.

(ii) For purposes of establishing a quorum, a Participant is considered present at a meeting only if the Participant’s Voting Senior Officer is either in physical

attendance at the meeting or is participating by conference telephone or other acceptable electronic means.

(iii) Any Participant recused from voting on a particular action pursuant to Section 5.1(b) above shall not be considered “entitled to vote” for purposes of establishing whether a quorum is present for a vote to be taken on that action.

(d) Qualifications for Voting Senior Officer of Bidding Participants. The following criteria must be met before a Voting Senior Officer is eligible to represent a Bidding Participant and serve on the Selection Committee:

(i) the Voting Senior Officer is not responsible for the Bidding Participant’s market operations, and is responsible primarily for the Bidding Participant’s legal and/or regulatory functions, including functions related to the formulation and implementation of the Bidding Participant’s legal and/or regulatory program;

(ii) the Bidding Participant has established functional separation of its legal and/or regulatory functions from its market operations and other business or commercial objectives;

(iii) the Voting Senior Officer ultimately reports (including through the Bidding Participant’s CEO or Chief Legal Officer/General Counsel) to an independent governing body that determines or oversees the Voting Senior Officer’s compensation, and the Voting Senior Officer does not receive any compensation (other than what is determined or overseen by the independent governing body) that is based on achieving business or commercial objectives;

(iv) the Voting Senior Officer does not have responsibility for any non-regulatory functions of the Bidding Participant, other than the legal aspects of the organization performed by the Chief Legal Officer/General Counsel or the Office of the General Counsel;

(v) the ultimate decision making of the Voting Senior Officer position is tied to the regulatory effectiveness of the Bidding Participant, as opposed to other business or commercial objectives;

(vi) promotion or termination of the Voting Senior Officer is not based on achieving business or commercial objectives;

(vii) the Voting Senior Officer has no decision-making authority with respect to the development or formulation of the Bid submitted by or including the Participant or an Affiliate of the Participant; however, the staff assigned to developing and formulating such Bid may consult with the Voting Senior Officer, provided such staff members cannot share information concerning the Bid with the Voting Senior Officer;

(viii) the Voting Senior Officer does not report to any senior officers responsible for the development or formulation of the Bid submitted by or including the Participant or by an Affiliate of the Participant; however, joint reporting to the Bidding Participant’s CEO or similar executive officer by the Voting Senior Officer and senior staff developing and formulating such Bid is permissible, but the Bidding Participant’s CEO or

similar executive officer cannot share information concerning such Bid with the Voting Senior Officer;

(ix) the compensation of the Voting Senior Officer is not separately tied to income earned if the Bid submitted by or including the Participant or an Affiliate of the Participant is selected; and

(x) the Voting Senior Officer, any staff advising the Voting Senior Officer, and any similar executive officer or member of an independent governing body to which the Voting Senior Officer reports may not disclose to any Person any non-public information gained during the review of Bids, presentation by Qualified Bidders, and selection process. Staff advising the Voting Senior Officer during the Bid review, presentation, and selection process may not include the staff, contractors, or subcontractors that are developing or formulating the Bid submitted by or including a Participant or an Affiliate of the Participant.

Section 5.2. Bid Evaluation and Initial Plan Processor Selection.

(a) Initial Bid Review to Determine Qualified Bids.

(i) The Selection Committee shall review all Bids in accordance with the process developed by the Selection Committee.

(ii) After review, the Selection Committee shall vote on each Bid to determine whether such Bid is a Qualified Bid. A Bid that is deemed unqualified by at least a two-thirds (2/3rds) vote of the Selection Committee shall not be deemed a Qualified Bid and shall be eliminated individually from further consideration.

(b) Selection of Shortlisted Bids.

(i) Each Qualified Bidder shall be given the opportunity to present its Bid to the Selection Committee. Following the presentations by Qualified Bidders, the Selection Committee shall review and evaluate the Qualified Bids to select the Shortlisted Bids in accordance with the process in this Section 5.1(b).

(ii) If there are six (6) or fewer Qualified Bids, all such Qualified Bids shall be Shortlisted Bids.

(iii) If there are more than six (6) Qualified Bids but fewer than eleven (11) Qualified Bids, the Selection Committee shall select five (5) Qualified Bids as Shortlisted Bids, subject to the requirement in Section 5.2(d) below. Each Voting Senior Officer shall select a first, second, third, fourth, and fifth choice from among the Qualified Bids.

(A) A weighted score shall be assigned to each choice as follows:

- (1) First choice receives five (5) points;
- (2) Second choice receives four (4) points;

- (3) Third choice receives three (3) points;
- (4) Fourth choice receives two (2) points; and
- (5) Fifth choice receives one (1) point.

(B) The five (5) Qualified Bids receiving the highest cumulative scores shall be Shortlisted Bids.

(C) In the event of a tie to select the five Shortlisted Bids, all such tied Qualified Bids shall be Shortlisted Bids.

(D) To the extent there are Non-SRO Bids that are Qualified Bids, the Shortlisted Bids selected pursuant to this Section 5.2(b)(iii) must, if possible, include at least two Non-SRO Bids. If, following the vote set forth in this Section 5.2(b)(iii), no Non-SRO Bid was selected as a Shortlisted Bid, the two Non-SRO Bids receiving the highest cumulative votes (or one Non-SRO Bid if a single Non-SRO Bid is a Qualified Bid) shall be added as Shortlisted Bids. If one Non-SRO Bid was selected as a Shortlisted Bid, the Non-SRO Bid receiving the next highest cumulative vote shall be added as a Shortlisted Bid.

(iv) If there are eleven (11) or more Qualified Bids, the Selection Committee shall select fifty percent (50%) of the Qualified Bids as Shortlisted Bids, subject to the requirement in Section 5.2(d) below. If there is an odd number of Qualified Bids, the number of Shortlisted Bids chosen shall be rounded up to the next whole number (e.g., if there are thirteen Qualified Bids, then seven Shortlisted Bids shall be selected). Each Voting Senior Officer shall select as many choices as Shortlisted Bids to be chosen.

(A) A weighted score shall be assigned to each choice in single point increments as follows:

- (1) Last receives one (1) point;
- (2) Next-to-last choice receives two (2) points;
- (3) Second-from-last choice receives three (3) points;
- (4) Third-from-last choice receives four (4) points;
- (5) Fourth-from-last choice receives five (5) points; and
- (6) Fifth-from-last choice receives six (6) points.

For each additional Shortlisted Bid that must be chosen, the points assigned shall increase in single point increments.

(B) The fifty percent (50%) of Qualified Bids (or, if there is an odd number of Qualified Bids, the next whole number above fifty percent (50%) of Qualified Bids) receiving the highest cumulative scores shall be Shortlisted Bids.

(C) In the event of a tie to select the Shortlisted Bids, all such tied Qualified Bids shall be Shortlisted Bids.

(D) To the extent there are Non-SRO Bids that are Qualified Bids, the Shortlisted Bids selected pursuant to this Section 5.2(b)(iv) must, if possible, include at least two Non-SRO Bids. If, following the vote set forth in this Section 5.2(b)(iv), no Non-SRO Bid was selected as a Shortlisted Bid, the two Non-SRO Bids receiving the highest cumulative votes (or one Non-SRO Bid if a single Non-SRO Bid is a Qualified Bid) shall be added as Shortlisted Bids. If one Non-SRO Bid was selected as a Shortlisted Bid, the Non-SRO Bid receiving the next highest cumulative vote shall be added as a Shortlisted Bid.

(c) Formulation of the CAT NMS Plan.

(i) The Selection Committee shall review the Shortlisted Bids to identify optimal proposed solutions for the CAT and provide descriptions of such proposed solutions for inclusion in this Agreement. This process may, but is not required to, include iterative discussions with Shortlisted Bidders to address any aspects of an optimal proposed solution that were not fully addressed in a particular Bid.

(ii) Prior to the approval of the CAT NMS Plan, all Shortlisted Bidders will be permitted to revise their Bids one or more times if the Selection Committee determines, by majority vote, that such revision(s) are necessary or appropriate.

(iii) Prior to approval of the CAT NMS Plan, and either before or after any revisions to Shortlisted Bids are accepted, the Selection Committee may determine, by at least a two-thirds vote, to narrow the number of Shortlisted Bids to three Bids, in accordance with the process in this Section 5.2(c)(iii).

(A) Each Voting Senior Officer shall select a first, second, and third choice from among the Shortlisted Bids.

(B) A weighted score shall be assigned to each choice as follows:

- (1) First receives three (3) points;
- (2) Second receives two (2) points; and
- (3) Third receives one (1) point.

(C) The three Shortlisted Bids receiving the highest cumulative scores will be the new set of Shortlisted Bids.

(D) In the event of a tie that would result in more than three final Shortlisted Bids, the votes shall be recounted, omitting each Voting Senior Officer's third choice, in order to break the tie. If this recount produces a tie that would result in a number of final Shortlisted Bids larger than or equal to that from the initial count, the results of the initial count shall constitute the final set of Shortlisted Bids.

(E) To the extent there are Non-SRO Bids that are Shortlisted Bids, the final Shortlisted Bids selected pursuant to this Section 5.2(c)(iii) must, if possible, include at least one Non-SRO Bid. If following the vote set forth in this Section 5.2(c)(iii), no Non-SRO Bid was selected as a final Shortlisted Bid, the Non-SRO Bid receiving the highest cumulative votes shall be retained as a Shortlisted Bid.

(F) The third party tabulating votes, as specified in Section 5.1(b)(5), shall identify to the Selection Committee the new set of Shortlisted Bids, but shall keep confidential the individual scores and rankings of the Shortlisted Bids from the process in this Section 5.2(c)(iii).

(iv) The Participants shall incorporate information on optimal proposed solutions in this Agreement, including cost-benefit information as required by SEC Rule 613.

(d) Review of Shortlisted Bids Under the CAT NMS Plan.

(i) A Shortlisted Bidder shall be permitted to revise its Bid only upon approval by a majority of the Selection Committee, subject to the recusal provision in Section 5.1(b)(ii) above, that revisions are necessary or appropriate in light of the content of the Shortlisted Bidder's initial Bid and the provisions in this Agreement. A Shortlisted Bidder may not revise its Bid unless approved to do so by the Selection Committee pursuant to this Section 5.2(d)(i).

(ii) The Selection Committee shall review and evaluate all Shortlisted Bids, including any permitted revisions thereto submitted by Shortlisted Bidders. In performing the review and evaluation, the Selection Committee may consult with the Advisory Committee established pursuant to paragraph (b)(7) of SEC Rule 613 and Section 4.13, and such other Persons as the Selection Committee deems appropriate.

(e) Selection of Plan Processor Under this Agreement.

(i) There shall be two rounds of voting by the Selection Committee to select the Initial Plan Processor from among the Shortlisted Bidders. Each round shall be scored independently of prior rounds of voting, including the scoring to determine the Shortlisted Bids under Section 5.2(b).

(ii) Each Participant shall have one vote in each round, except that no Bidding Participant shall be entitled to vote in any round if the Participant's Bid, a Bid submitted by an Affiliate of the Participant, or a Bid including the Participant or an Affiliate of the Participant is considered in such round.

(iii) First Round Voting by the Selection Committee.

(A) In the first round of voting, each Voting Senior Officer, subject to the recusal provisions in Section 5.2(e)(ii), shall select a first and second choice from among the Shortlisted Bids.

(B) A weighted score shall be assigned to each choice as follows:

(1) First choice receives two (2) points; and

(2) Second choice receives one (1) point.

(C) The two Shortlisted Bids receiving the highest cumulative scores in the first round shall advance to the second round.

(D) In the event of a tie that would result in more than two Shortlisted Bids advancing to the second round, the tie shall be broken by assigning one point per vote, with the Shortlisted Bid(s) receiving the highest number of votes advancing to the second round. If, at this point, the Shortlisted Bids remain tied, a revote shall be taken with each vote receiving one point. If the revote results in a tie, the Participants shall identify areas for further discussion and, following any such discussion, voting shall continue until two Shortlisted Bids are selected to advance to the second round.

(iv) Second Round Voting by the Selection Committee.

(A) In the second round of voting, each Voting Senior Officer, subject to the recusal provisions in Section 5.2(e)(ii) above, shall vote for one Shortlisted Bid.

(B) The Shortlisted Bid receiving the most votes in the second round shall be selected, and the proposed entity included in the Shortlisted Bid to serve as the Plan Processor shall be selected as the Plan Processor.

(C) In the event of a tie, a revote shall be taken. If the revote results in a tie, the Participants shall identify areas for further discussions with the two Shortlisted Bidders. Following any such discussions, voting shall continue until one Shortlisted Bid is selected.

ARTICLE VI

FUNCTIONS AND ACTIVITIES OF CAT SYSTEM

Section 6.1. Plan Processor.

(a) The Initial Plan Processor shall be selected in accordance with Article V and shall serve as the Plan Processor until its resignation or removal from such position in accordance with this Section 6.1. The Company, under the direction of the Operating Committee shall enter into one or more agreements with the Plan Processor obligating the Plan Processor to perform the functions and duties contemplated by this Agreement to be performed by the Plan Processor, as well as such other functions and duties the Operating Committee deems necessary or appropriate.

(b) The Plan Processor may appoint such officers of the Plan Processor as it deems necessary and appropriate to perform its functions under this Agreement and SEC Rule 613; provided that the Plan Processor shall, at a minimum, appoint, in accordance with Section 6.2: (i) the Chief Compliance Officer; (ii) the Chief Information Security Officer; and (iii) the Independent Auditor. Notwithstanding anything to the contrary, the Operating Committee, by Supermajority Vote, shall approve any appointment or removal of the Chief Compliance Officer, the Chief Information Security Officer, or the Independent Auditor.

(c) The Plan Processor shall develop and, with the prior approval of the Operating Committee, implement policies, procedures, and control structures related to the CAT System that are consistent with SEC Rule 613(e)(4), Appendix C, and Appendix D.

(d) The Plan Processor shall:

(i) comply with applicable provisions of 15 U.S.C. § 78u-6 (Securities Whistleblower Incentives and Protection) and the recordkeeping requirements of SEC Rule 613(e)(8);

(ii) consistent with Appendix D, Central Repository Requirements, ensure the effective management and operation of the Central Repository;

(iii) consistent with Appendix D, Data Management, ensure the accuracy of the consolidation of the CAT Data reported to the Central Repository pursuant to Section 6.3 and Section 6.4; and

(iv) consistent with Appendix D, Upgrade Process and Development of New Functionality, design and implement appropriate policies and procedures governing the determination to develop new functionality for the CAT including, among other requirements, a mechanism by which changes can be suggested by Advisory Committee members, Participants, or the SEC. Such policies and procedures also shall: (A) provide for the escalation of reviews of proposed technological changes and upgrades (including as required by Section 6.1(i) and Section 6.1(j) or as otherwise appropriate) to the Operating Committee; and (B) address the handling of surveillance, including coordinated, SEC Rule 17d-2 or Regulatory Service Agreement(s) (“RSA”) surveillance queries and requests for data.

(e) Any policy, procedure or standard (and any material modification or amendment thereto) applicable primarily to the performance of the Plan Processor’s duties as the Plan Processor (excluding, for the avoidance of doubt, any policies, procedures or standards generally applicable to the Plan Processor’s operations and employees) shall become effective only upon approval thereof by the Operating Committee.

(f) The Plan Processor shall, subject to the prior approval of the Operating Committee, establish appropriate procedures for escalation of matters to the Operating Committee.

(g) In addition to other policies, procedures and standards generally applicable to the Plan Processor’s employees and contractors, the Plan Processor shall have hiring standards and shall conduct and enforce background checks (e.g., fingerprint-based) for all of its employees and contractors to ensure the protection, safeguarding and security of the facilities, systems, networks, equipment and data of the CAT System, and shall have an insider and external threat policy to detect, monitor and remedy cyber and other threats. Each Participant will also conduct background checks of its employees and contractors that will use the CAT System.

(h) The Plan Processor shall enter into appropriate Service Level Agreements (“SLAs”) governing the performance of the Central Repository, as generally described in Appendix D, Functionality of the CAT System, with the prior approval of the Operating Committee. The Plan Processor in conjunction with the Operating Committee shall regularly review and, as necessary, update the SLAs, in accordance with the terms of the SLAs. As further contemplated in Appendix C, System Service Level Agreements (SLAs), and in Appendix D, System SLAs, the Plan Processor may enter into appropriate service level agreements with third parties applicable to the Plan Processor’s functions related to the CAT System (“Other SLAs”), with the prior approval of the Operating Committee. The Chief Compliance Officer and/or the Independent Auditor shall, in conjunction with the Plan Processor and, as necessary, the Operating Committee, regularly review and, as necessary, update the Other SLAs, in accordance with the terms of the applicable Other SLA.

(i) The Plan Processor shall, on an ongoing basis and consistent with any applicable policies and procedures, evaluate and implement potential system changes and upgrades to maintain and improve the normal day-to-day operating function of the CAT System.

(j) In consultation with the Operating Committee, the Plan Processor shall, on an as needed basis and consistent with any applicable operational and escalation policies and procedures, implement such material system changes and upgrades as may be required to ensure effective functioning of the CAT System (i.e., those system changes and upgrades beyond the scope contemplated by Section 6.1(i)).

(k) In consultation with the Operating Committee, the Plan Processor shall, on an as needed basis, implement system changes and upgrades to the CAT System to ensure compliance with any applicable laws, regulations or rules (including those promulgated by the SEC or any Participant).

(l) The Plan Processor shall develop and, with the prior approval of the Operating Committee, implement a securities trading policy, as well as necessary procedures, control structures and tools to enforce this policy. The securities trading policy shall include:

- (i) the category(ies) of employees, and as appropriate, contractors, of the Plan Processor to whom the policy will apply;
- (ii) the scope of securities that are allowed or not allowed for trading;
- (iii) the creation and maintenance of restricted trading lists;
- (iv) a mechanism for declaring new or open account activity;
- (v) a comprehensive list of any exclusions to the policy (e.g., blind trust, non-discretionary accounts);
- (vi) requirements for duplicative records to be received by the Plan Processor for periodic review; and
- (vii) a mechanism to review employee trading accounts.

(m) The Plan Processor shall develop and, with the prior approval of the Operating Committee, implement a training program that addresses the security and confidentiality of all information accessible from the CAT, as well as the operational risks associated with accessing the Central Repository. The training program will be made available to all individuals who have access to the Central Repository on behalf of the Participants or the SEC, prior to such individuals being granted access to the Central Repository.

(n) The Operating Committee will review the Plan Processor's performance under this Agreement at least once each year, or more often than once each year upon the request of two Participants that are not Affiliated Participants. The Operating Committee shall notify the SEC of any determination made by the Operating Committee concerning the continuing engagement of the Plan Processor as a result of the Operating Committee's review of the Plan Processor and shall provide the SEC with a copy of any reports that may be prepared in connection therewith.

(o) The Plan Processor shall provide the Operating Committee regular reports on the CAT System's operation and maintenance. The reports shall address:

(i) operational performance management information regarding the capacity and performance of the CAT System as specified by the Operating Committee. Such reports shall at a minimum address:

- (A) the capacity and performance of the Central Repository, including at a minimum the requirements set forth in Appendix D, Central Repository Requirements;

(B) the basic functionality of the CAT System, including the functions set forth in Appendix D, Functionality of the CAT System.

(ii) data security issues for the Plan Processor and the Central Repository taking into account the data security requirements set forth in Appendix D, Data Security;

(iii) Participant usage statistics for the Plan Processor and the Central Repository, including capacity planning studies and daily reports called for by Appendix D, Capacity Requirements, as well as business continuity planning and disaster recovery issues for the Plan Processor and the Central Repository, taking into account the business continuity planning and disaster recovery requirements set forth in Appendix D, BCP / DR Process;

(iv) system improvement issues with the Plan Processor and the Central Repository as contemplated by Appendix D, Upgrade Process and Development of New Functionality;

(v) Error Rates relating to the Central Repository,¹ including, in each case to the extent the Operating Committee determines necessary or advisable, Error Rates by day and by delta over time, and Compliance Thresholds by CAT Reporter, by Reportable Event, by age before resolution, by symbol, by symbol type (e.g., ETF and Index) and by event time (by hour and cumulative on the hour) as set forth in Appendix C, Error Communication, Correction, and Processing;

(vi) financial statements of the Plan Processor prepared in accordance with GAAP (A) audited by an independent public accounting firm or (B) certified by the Plan Processor's Chief Financial Officer (which financial statements contemplated by this Section 6.1(o)(vi) shall be provided no later than 180 days after the Plan Processor's fiscal year end);

(vii) continued solvency of the Plan Processor;

(viii) budgetary status of any items subject to Section 6.2(a)(ii);

(ix) internal audit analysis and the status of any internal audit related deliverables; and

(x) additional items as requested by the Operating Committee, any Officer of the Company, or the Independent Auditor.

(p) Upon the request of the Operating Committee or any Subcommittee, the Plan Processor shall attend any meeting of the Operating Committee or such Subcommittee.

(q) The Operating Committee, by Supermajority Vote, may remove the Plan Processor from such position at any time.

¹ This Error Rate includes errors by CAT Reporters and linkage validation errors. In addition, errors attributable to the Plan Processor will be memorialized and reported to the Operating Committee.

(r) The Operating Committee may, by Majority Vote, remove the Plan Processor from such position at any time if it determines that the Plan Processor has failed to perform its functions in a reasonably acceptable manner in accordance with the provisions of this Agreement or that the Plan Processor's expenses have become excessive and are not justified. In making such determination, the Operating Committee shall consider, among other factors: (i) the reasonableness of the Plan Processor's response to requests from Participants or the Company for technological changes or enhancements; (ii) results of any assessments performed pursuant to Section 6.6; (iii) the timeliness of conducting preventative and corrective information technology system maintenance for reliable and secure operations; (iv) compliance with requirements of Appendix D; and (v) such other factors related to experience, technological capability, quality and reliability of service, costs, back-up facilities, failure to meet service level agreement(s) and regulatory considerations as the Operating Committee may determine to be appropriate.

(s) The Plan Processor may resign from such position; provided that no such resignation shall be effective earlier than two (2) years (or such other shorter period as may be determined by the Operating Committee by Supermajority Vote) after the Plan Processor provides written notice of such resignation to the Company.

(t) The Operating Committee, by Supermajority Vote, shall fill any vacancy in the Plan Processor position, and shall establish a Plan Processor Selection Subcommittee in accordance with Section 4.12 to evaluate and review Bids and make a recommendation to the Operating Committee with respect to the selection of the successor Plan Processor. Any successor Plan Processor appointed pursuant to this Section 6.1(t) shall be subject to all the terms and conditions of this Agreement applicable to the Plan Processor commencing from such appointment effective date.

(u) The Plan Processor shall afford to Participants and the Commission such access to the Representatives of the Plan Processor as any Participant or the Commission may request solely for the purpose of performing such Person's regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations or any contractual obligations, and shall direct such Representatives to cooperate with any inquiry, investigation, or proceeding conducted by or on behalf of any Participant or the Commission related to such purpose.

Section 6.2. Chief Compliance Officer and Chief Information Security Officer.

(a) Chief Compliance Officer.

(i) The Plan Processor shall designate an employee of the Plan Processor to serve, subject to the approval of the Operating Committee by Supermajority Vote, as the Chief Compliance Officer. The Plan Processor shall also designate at least one other employee (in addition to the person then serving as Chief Compliance Officer), which employee the Operating Committee has previously approved, to serve temporarily as the Chief Compliance Officer if the employee then serving as the Chief Compliance Officer becomes unavailable or unable to serve in such capacity (including by reason of injury or illness). Any person designated to serve as the Chief Compliance Officer (including to serve temporarily) shall be appropriately qualified to serve in such capacity based on the duties and responsibilities assigned

to the Chief Compliance Officer under this Agreement and shall dedicate such person's entire working time to such service (or temporary service) (except for any time required to attend to any incidental administrative matters related to such person's employment with the Plan Processor that do not detract in any material respect from such person's service as the Chief Compliance Officer). The Plan Processor may, at its discretion: (A) designate another employee previously approved by the Operating Committee by Supermajority Vote to serve in such capacity to temporarily serve as the Chief Compliance Officer if the employee then serving as the Chief Compliance Officer becomes unavailable or unable to serve as the Chief Compliance Officer (including by reason of injury or illness) for a period not in excess of thirty (30) days; or (B) designate another employee of the Plan Processor to replace, subject to approval of the Operating Committee by a Supermajority Vote, the Chief Compliance Officer. The Plan Processor shall promptly designate another employee of the Plan Processor to replace, subject to the approval of the Operating Committee by Supermajority Vote, the Chief Compliance Officer if the Chief Compliance Officer's employment with the Plan Processor terminates or the Chief Compliance Officer is otherwise unavailable or unable to serve as the Chief Compliance Officer (including by reason of injury or illness) for a period in excess of thirty (30) days. The Operating Committee shall report any action taken pursuant to Section 6.2(a)(i) to the SEC.

(ii) The Plan Processor, subject to the oversight of the Operating Committee, shall ensure that the Chief Compliance Officer has appropriate resources to fulfill the obligations of the Chief Compliance Officer set forth in SEC Rule 613 and in this Agreement.

(iii) In respect of all duties and responsibilities of the Chief Compliance Officer in such capacity (including those set forth in this Agreement), the Chief Compliance Officer shall be directly responsible and shall directly report to the Operating Committee, notwithstanding that he or she is employed by the Plan Processor.

(iv) The compensation (including base salary and bonus) of the Chief Compliance Officer shall be payable by the Plan Processor, but subject to review and approval by the Operating Committee, and the Operating Committee shall render the Chief Compliance Officer's annual performance review.

(v) The Chief Compliance Officer shall:

(A) regularly review the operation of the Central Repository to ensure its continued effectiveness based on market and technological developments and consistent with Appendix D, Upgrade Process and Development of New Functionality, and make any appropriate recommendations for enhancements to the nature of the information collected and the manner in which it is processed;

(B) identify and assist the Company in retaining an appropriately qualified independent auditor of national recognition (subject to the approval of the Operating Committee by Supermajority Vote, the "Independent Auditor") and, in collaboration with such Independent Auditor, create and implement an annual audit plan (subject

to the approval of the Operating Committee) which shall at a minimum include a review of all Plan Processor policies, procedures and control structures;

(C) in collaboration with the Chief Information Security Officer, and consistent with Appendix D, Data Security, and any other applicable requirements related to data security, Customer Account Information and Customer Identifying Information, identify and assist the Company in retaining an appropriately qualified independent auditor (based on specialized technical expertise, which may be the Independent Auditor or subject to the approval of the Operating Company by Supermajority Vote, another appropriately qualified independent auditor), and in collaboration with such independent auditor, create and implement an annual audit plan (subject to the approval of the Operating Committee), which shall at a minimum include a review of all Plan Processor policies, procedures and control structures, and real time tools that monitor and address data security issues for the Plan Processor and the Central Repository;

(D) have the ability to hire or retain adequate resources as needed (e.g., advisors and counsel) to fulfill its obligations;

(E) perform reviews with respect to the matters referenced in Section 4.12(b) and report periodically, and on an as needed basis, to the Operating Committee concerning the findings of any such reviews;

(F) report to the Operating Committee and conduct any relevant review of the Plan Processor or the Central Repository requested by the Operating Committee, including directing internal or external auditors, as appropriate, to support any such review;

(G) perform and provide the regular written assessment to the SEC required by Section 6.6 and SEC Rule 613;

(H) regularly review the information security program developed and maintained by the Plan Processor pursuant to Section 6.12 and determine the frequency of such reviews;

(I) report in a timely manner to the Operating Committee any instances of non-compliance by the Plan Processor with any of the Central Repository's policies or procedures with respect to information security;

(J) conduct regular monitoring of the CAT System for compliance by each Participant and each Industry Member with SEC Rule 613, this Agreement and Appendix D, Reporting and Linkage Requirements, and provide the results: (1) with regard to Industry Members, to each Participant with oversight of such Industry Member or to such Participant's agent pursuant to a regulatory services agreement, or

to the Participant responsible for enforcing compliance by such Industry Member pursuant to an agreement entered into by the applicable Participant pursuant to SEC Rule 17d-2; and (2) with regard to each Participant, to the chief regulatory officer or equivalent of such Participant;

(K) develop a mechanism to conduct regular monitoring of the CAT System for compliance by each Participant with SEC Rule 613, this Agreement, and Appendix D, Reporting and Linkage Requirements;

(L) develop and implement a notification and escalation process to resolve and remediate any alleged noncompliance by a Participant or Industry Member with the rules of the CAT, which process will include appropriate notification and order of escalation to a Participant, the Operating Committee, or the Commission;

(M) develop and conduct an annual assessment of Business Clock synchronization as specified in Section 6.8(c);

(N) have access to Plan Processor staff and documentation as appropriate to fulfill its obligations;

(O) have access to the Operating Committee, including attending all regular, special and emergency meetings of the Operating Committee as a non-voting observer; provided, however, that the Chief Compliance Officer shall not have the right to attend any Executive Session that the Operating Committee may hold;

(P) work on a more regular and frequent basis with the Compliance Subcommittee or other Subcommittee as may be determined by the Operating Committee; and

(Q) oversee the Plan Processor's compliance with applicable laws, rules and regulations related to the CAT System, in its capacity as Plan Processor.

(b) Chief Information Security Officer.

(i) The Plan Processor shall designate an employee of the Plan Processor to serve, subject to the approval of the Operating Committee by Supermajority Vote, as the Chief Information Security Officer. The Plan Processor shall also designate at least one other employee (in addition to the person then serving as Chief Information Security Officer), which employee the Operating Committee has previously approved, to serve temporarily as the Chief Information Security Officer if the employee then serving as the Chief Information Security Officer becomes unavailable or unable to serve in such capacity (including by reason of injury or illness). Any person designated to serve as the Chief Information Security Officer (including to serve temporarily) shall be appropriately qualified to serve in such capacity based on the duties and responsibilities assigned to the Chief Information Security Officer under this

Agreement and shall dedicate such person's entire working time to such service (or temporary service) (except for any time required to attend to any incidental administrative matters related to such person's employment with the Plan Processor that do not detract in any material respect from such person's service as the Chief Information Security Officer). The Plan Processor may, at its discretion: (A) designate another employee previously approved by the Operating Committee by Supermajority Vote to serve in such capacity to temporarily serve as the Chief Information Security Officer if the employee then serving as Chief Information Security Officer becomes unavailable or unable to serve as Chief Information Security Officer (including by reason of injury or illness) for a period not in excess of thirty (30) days; or (B) designate another employee of the Plan Processor to replace, subject to approval of the Operating Committee by a Supermajority Vote, the Chief Information Security Officer. The Plan Processor shall promptly designate another employee of the Plan Processor to replace, subject to the approval of the Operating Committee by Supermajority Vote, the Chief Information Security Officer if the Chief Information Security Officer's employment with the Plan Processor terminates or the Chief Information Security Officer is otherwise unavailable or unable to serve as Chief Information Security Officer (including by reason of injury or illness) for a period in excess of thirty (30) days. The Operating Committee shall report any action taken pursuant to Section 6.2(b)(i) to the SEC.

(ii) The Plan Processor, subject to the oversight of the Operating Committee, shall ensure that the Chief Information Security Officer has appropriate resources to fulfill the obligations of the Chief Information Security Officer set forth in SEC Rule 613 and in this Agreement, including providing appropriate responses to questions posed by the Participants and the SEC.

(iii) In respect of all duties and responsibilities of the Chief Information Security Officer in such capacity (including those set forth in this Agreement), the Chief Information Security Officer shall be directly responsible and directly report to the Operating Committee, notwithstanding that he or she is employed by the Plan Processor.

(iv) The compensation (including base salary and bonus) of the Chief Information Security Officer shall be payable by the Plan Processor, but subject to review and approval by the Operating Committee, and the Operating Committee shall render the Chief Information Security Officer's annual performance review.

(v) Consistent with Appendices C and D, the Chief Information Security Officer shall be responsible for creating and enforcing appropriate policies, procedures, and control structures to monitor and address data security issues for the Plan Processor and the Central Repository including:

(A) data security, including the standards set forth in Appendix D, Data Security;

(B) connectivity and data transfer, including the standards set forth in Appendix D, Connectivity and Data Transfer;

(C) data encryption, including the standards set forth in Appendix D, Data Encryption;

(D) data storage and environment, including the standards set forth in Appendix D, Data Storage and Environment;

(E) data access and breach management, including the standards set forth in Appendix D, Data Access, and Appendix D, Breach Management;

(F) PII data requirements, including the standards set forth in Appendix D, PII Data Requirements;

(G) industry standards, including the standards set forth in Appendix D, Industry Standards; and

(H) penetration test reviews, which shall occur at least every year or earlier, or at the request of the Operating Committee, set forth in Appendix D, Data Storage and Environment.

(vi) At regular intervals, to the extent that such information is available to the Company, the Chief Information Security Officer shall report to the Operating Committee the activities of the Financial Services Information Sharing and Analysis Center (“FS-ISAC”) or other comparable body.

(vii) The Chief Information Security Officer shall review the information security policies and procedures of the Participants that are related to the CAT to ensure that such policies and procedures are comparable to the information security policies and procedures applicable to the Central Repository. If the Chief Information Security Officer, in consultation with the Chief Compliance Officer, finds that any such policies and procedures are not comparable to the policies and procedures applicable to the CAT System, and the issue is not promptly addressed by the applicable Participant, the Chief Information Security Officer, in consultation with the Chief Compliance Officer, will be required to notify the Operating Committee of such deficiencies.

Section 6.3. Data Recording and Reporting by Participants. This Section 6.3 shall become effective on the first anniversary of the Effective Date and shall remain effective thereafter until modified or amended in accordance with the provisions of this Agreement and applicable law.

(a) Format. As contemplated in Appendix D, Data Types and Sources, each Participant shall report Participant Data to the Central Repository for consolidation and storage in a format or formats specified by the Plan Processor, approved by the Operating Committee and compliant with SEC Rule 613.

(b) Timing of Recording and Reporting.

(i) As further described in Appendix D, Reporting and Linkage Requirements, each Participant shall record Participant Data contemporaneously with the applicable Reportable Event.

(ii) Each Participant shall report Participant Data to the Central Repository by 8:00 a.m. Eastern Time on the Trading Day following the day the Participant records such Participant Data. A Participant may voluntarily report Participant Data prior to the 8:00 a.m. Eastern Time deadline.

(c) Applicable Securities.

(i) Each Participant that is a national securities exchange shall report Participant Data for each NMS Security registered or listed for trading on such exchange or admitted to unlisted trading privileges on such exchange.

(ii) Each Participant that is a national securities association shall report Participant Data for each Eligible Security for which transaction reports are required to be submitted to such association.

(d) Participant Data. Subject to Section 6.3(c), and Appendix D, Reporting and Linkage Requirements, and in accordance with the Technical Specifications, each Participant shall record and electronically report to the Central Repository the following details for each order and each Reportable Event, as applicable ("Participant Data"):

(i) for original receipt or origination of an order:

(A) Firm Designated ID(s) for each Customer;

(B) CAT-Order-ID;

(C) SRO-Assigned Market Participant Identifier of the Industry Member receiving or originating the order;

(D) date of order receipt or origination;

(E) time of order receipt or origination (using timestamps pursuant to Section 6.8); and

(F) Material Terms of the Order;

(ii) for the routing of an order:

(A) CAT-Order-ID;

(B) date on which the order is routed;

- (C) time at which the order is routed (using timestamps pursuant to Section 6.8);
- (D) SRO-Assigned Market Participant Identifier of the Industry Member or Participant routing the order;
- (E) SRO-Assigned Market Participant Identifier of the Industry Member or Participant to which the order is being routed;
- (F) if routed internally at the Industry Member, the identity and nature of the department or desk to which the order is routed; and
- (G) Material Terms of the Order;

information:

- (iii) for the receipt of an order that has been routed, the following

- (A) CAT-Order-ID;
- (B) date on which the order is received;
- (C) time at which the order is received (using timestamps pursuant to Section 6.8);
- (D) SRO-Assigned Market Participant Identifier of the Industry Member or Participant receiving the order;
- (E) SRO-Assigned Market Participant Identifier of the Industry Member or Participant routing the order; and
- (F) Material Terms of the Order;

- (iv) if the order is modified or cancelled:

- (A) CAT-Order-ID;
- (B) date the modification or cancellation is received or originated;
- (C) time at which the modification or cancellation is received or originated (using timestamps pursuant to Section 6.8);
- (D) price and remaining size of the order, if modified;
- (E) other changes in the Material Terms of the Order, if modified; and

(F) whether the modification or cancellation instruction was given by the Customer or was initiated by the Industry Member or Participant;

(v) if the order is executed, in whole or in part:

(A) CAT-Order-ID;

(B) date of execution;

(C) time of execution (using timestamps pursuant to Section 6.8);

(D) execution capacity (principal, agency or riskless principal);

(E) execution price and size;

(F) SRO-Assigned Market Participant Identifier of the Participant or Industry Member executing the order;

(G) whether the execution was reported pursuant to an effective transaction reporting plan or the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information; and

(vi) other information or additional events as may be prescribed in

Appendix D, Reporting and Linkage Requirements.

(e) CAT-Reporter-ID.

(i) Each Participant must submit to the Central Repository, on a daily basis,

(A) all SRO-Assigned Market Participant Identifiers used by its Industry Members or itself; and

(B) information to identify (1) each such Industry Member, including CRD number and LEI if such LEI has been obtained, and itself, including LEI, if such LEI has been obtained.

(ii) The Plan Processor will use the SRO-Assigned Market Participant Identifiers and identifying information to assign a CAT-Reporter-ID to each Industry Member or Participant for internal use across all CAT Data in the Central Repository.

(f) Means of Transmission. As contemplated in Appendix D, each Participant may utilize such methods as may be provided by the Plan Processor and approved by the Operating Committee to transmit Participant Data to the Central Repository.

Section 6.4. Data Reporting and Recording by Industry Members. The requirements for Industry Members under this Section 6.4 shall become effective on the second

anniversary of the Effective Date in the case of Industry Members other than Small Industry Members, or the third anniversary of the Effective Date in the case of Small Industry Members, and shall remain effective thereafter until modified or amended in accordance with the provisions of this Agreement and applicable law.

(a) Format. As contemplated in Appendix D, Data Types and Sources, each Participant shall, through its Compliance Rule, require its Industry Members to report Industry Member Data to the Central Repository for consolidation and storage in a format or formats specified by the Plan Processor, approved by the Operating Committee and compliant with SEC Rule 613.

(b) Timing of Recording and Reporting.

(i) As further described in Appendix D, Reporting and Linkage Requirements, each Participant shall, through its Compliance Rule, require its Industry Members to record Recorded Industry Member Data contemporaneously with the applicable Reportable Event.

(ii) Consistent with Appendix D, Reporting and Linkage Requirements, each Participant shall, through its Compliance Rule, require its Industry Members to report: (A) Recorded Industry Member Data to the Central Repository by 8:00 a.m. Eastern Time on the Trading Day following the day the Industry Member records such Recorded Industry Member Data; and (B) Received Industry Member Data to the Central Repository by 8:00 a.m. Eastern Time on the Trading Day following the day the Industry Member receives such Received Industry Member Data. Each Participant shall, through its Compliance Rule, permit its Industry Members to voluntarily report Industry Member Data prior to the applicable 8:00 a.m. Eastern Time deadline.

(c) Applicable Securities.

(i) Each Participant that is a national securities exchange shall, through its Compliance Rule, require its Industry Members to report Industry Member Data for each NMS Security registered or listed for trading on such exchange or admitted to unlisted trading privileges on such exchange.

(ii) Each Participant that is a national securities association shall, through its Compliance Rule, require its Industry Members to report Industry Member Data for each Eligible Security for which transaction reports are required to be submitted to such association.

(d) Required Industry Member Data.

(i) Subject to Section 6.4(c) and Section 6.4(d)(iii) with respect to Options Market Makers, and consistent with Appendix D, Reporting and Linkage Requirements, and the Technical Specifications, each Participant shall, through its Compliance Rule, require its Industry Members to record and electronically report to the Central Repository for each order and each Reportable Event the information referred to in Section 6.3(d), as applicable (“Recorded Industry Member Data”).

(ii) Subject to Section 6.4(c) and Section 6.4(d)(iii) with respect to Options Market Makers, and consistent with Appendix D, Reporting and Linkage Requirements, and the Technical Specifications, each Participant shall, through its Compliance Rule, require its Industry Members to record and report to the Central Repository the following, as applicable (“Received Industry Member Data” and collectively with the information referred to in Section 6.4(d)(i) “Industry Member Data”):

(A) if the order is executed, in whole or in part:

- (1) An Allocation Report;
- (2) SRO-Assigned Market Participant Identifier of the clearing broker or prime broker, if applicable; and
- (3) CAT-Order-ID of any contra-side order(s);

(B) if the trade is cancelled, a cancelled trade indicator; and

(C) for original receipt or origination of an order, the Firm Designated ID for the relevant Customer, and in accordance with Section 6.4(d)(iv), Customer Account Information and Customer Identifying Information for the relevant Customer.

(iii) With respect to the reporting obligations of an Options Market Maker with regard to its quotes in Listed Options, Reportable Events required pursuant to Section 6.3(d)(ii) and (iv) shall be reported to the Central Repository by an Options Exchange in lieu of the reporting of such information by the Options Market Maker. Each Participant that is an Options Exchange shall, through its Compliance Rule, require its Industry Members that are Options Market Makers to report to the Options Exchange the time at which a quote in a Listed Option is sent to the Options Exchange (and, if applicable, any subsequent quote modifications and/or cancellation time when such modification or cancellation is originated by the Options Market Maker). Such time information also shall be reported to the Central Repository by the Options Exchange in lieu of reporting by the Options Market Maker.

(iv) Each Industry Member must submit an initial set of the Customer information required in Section 6.4(d)(ii)(C) for Active Accounts to the Central Repository upon the Industry Member’s commencement of reporting to the Central Repository. Each Industry Member must submit to the Central Repository any updates, additions or other changes to the Customer information required in Section 6.4(d)(ii)(C) on a daily basis for all Active Accounts. In addition, on a periodic basis as designated by the Plan Processor and approved by the Operating Committee, each Industry Member will be required to submit to the Central Repository a complete set of all Customer information required in Section 6.4(d)(ii)(C). The Plan Processor will correlate such Customer information across all Industry Members, use it to assign a Customer-ID for each Customer, and use the Customer-ID to link all Reportable Events associated with an order for a Customer.

(v) Each Participant shall, through its Compliance Rule, require its Industry Members to record and report to the Central Repository other information or additional events as may be prescribed in Appendix D, Reporting and Linkage Requirements.

(vi) Each Industry Member must submit to the Central Repository information sufficient to identify such Industry Member, including CRD number and LEI, if such LEI has been obtained.

(e) Means of Transmission. As contemplated in Appendix D, Data Types and Sources, each Industry Member may utilize such methods as may be provided by the Plan Processor and approved by the Operating Committee to transmit Industry Member Data to the Central Repository.

Section 6.5. Central Repository.

(a) Collection of Data.

(i) The Central Repository, under the oversight of the Plan Processor, and consistent with Appendix D, Central Repository Requirements, shall receive, consolidate, and retain all CAT Data.

(ii) The Central Repository shall collect (from a SIP or pursuant to an NMS Plan) and retain on a current and continuing basis, in a format compatible with the Participant Data and Industry Member Data, all data, including the following (collectively, "SIP Data"):

(A) information, including the size and quote condition, on quotes including the National Best Bid and National Best Offer for each NMS Security;

(B) Last Sale Reports and transaction reports reported pursuant to an effective transaction reporting plan filed with the SEC pursuant to, and meeting the requirements of, SEC Rules 601 and 608;

(C) trading halts, Limit Up/Limit Down price bands, and Limit Up/Limit Down indicators; and

(D) summary data or reports described in the specifications for each of the SIPs and disseminated by the respective SIP.

(b) Retention of Data.

(i) Consistent with Appendix D, Data Retention Requirements, the Central Repository shall retain the information collected pursuant to paragraphs (c)(7) and (e)(7) of SEC Rule 613 in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention by the Plan Processor for a period of not less than six (6) years. Such data when available to the Participant regulatory staff and the SEC shall be linked.

(ii) The Plan Processor shall implement and comply with the records retention policy contemplated by Section 6.1(d)(i) (as such policy is reviewed and updated periodically in accordance with Section 6.1(d)(i)).

(c) Access to the Central Repository

(i) Consistent with Appendix D, Data Access, the Plan Processor shall provide Participants and the SEC access to the Central Repository (including all systems operated by the Central Repository), and access to and use of the CAT Data stored in the Central Repository, solely for the purpose of performing their respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules and regulations or any contractual obligations.

(ii) The Plan Processor shall create and maintain a method of access to CAT Data stored in the Central Repository that includes the ability to run searches and generate reports. The method in which the CAT Data is stored in the Central Repository shall allow the ability to return results of queries that are complex in nature, including market reconstruction and the status of order books at varying time intervals.

(iii) The Plan Processor shall, at least annually and at such earlier time promptly following a request by the Operating Committee, certify to the Operating Committee that only Participants and the SEC have access to the Central Repository (other than access provided to any Industry Member for the purpose of correcting CAT Data previously reported to the Central Repository by such Industry Member).

(iv) Appendix C, The Security and Confidentiality of Information Reported to the Central Repository, and Appendix D, Data Security, describes the security and confidentiality of the CAT Data, including how access to the Central Repository is controlled.

(d) Data Accuracy

(i) The Operating Committee shall set and periodically review a maximum Error Rate for data reported to the Central Repository. The initial maximum Error Rate shall be set to 5%.

(ii) Consistent with Appendix D, Reporting and Linkage Requirements and Data Security, the Operating Committee shall adopt policies and procedures, including standards, requiring CAT Data reported to the Central Repository be timely, accurate, and complete, and to ensure the integrity of such CAT Data (e.g., that such CAT Data has not been altered and remains reliable). The Plan Processor shall be responsible for implementing such policies and procedures.

(iii) Appendix D, Receipt of Data from Reporters, describes the mechanisms and protocols for Participant Data and Industry Member Data submission for all key phases, including:

(A) file transmission and receipt validation;

- (B) validation of CAT Data; and
- (C) validation of linkages.

(e) Appendix D, Receipt of Data from Reporters, also describes the mechanisms and protocols for managing and handling corrections of CAT Data. The Plan Processor shall require an audit trail for corrected CAT Data in accordance with mechanisms and protocols approved by the Operating Committee.

(f) Data Confidentiality

(i) The Plan Processor shall, without limiting the obligations imposed on Participants by this Agreement and in accordance with the framework set forth in, Appendix D, Data Security, and Functionality of the CAT System, be responsible for the security and confidentiality of all CAT Data received and reported to the Central Repository. Without limiting the foregoing, the Plan Processor shall:

(A) require all individuals who have access to the Central Repository (including the respective employees and consultants of the Participants and the Plan Processor, but excluding employees and Commissioners of the SEC) to agree: (1) to use appropriate safeguards to ensure the confidentiality of CAT Data stored in the Central Repository; and (2) not to use CAT Data stored in the Central Repository for purposes other than surveillance and regulation in accordance with such individual's employment duties; provided that a Participant will be permitted to use the Raw Data it reports to the Central Repository for regulatory, surveillance, commercial or other purposes as permitted by applicable law, rule, or regulation;

(B) require all individuals who have access to the Central Repository (including the respective employees and consultants of the Participants and the Plan Processor, but excluding employees and Commissioners of the SEC) to execute a personal "Safeguard of Information Affidavit" in a form approved by the Operating Committee providing for personal liability for misuse of data;

(C) develop and maintain a comprehensive information security program with a dedicated staff for the Central Repository, consistent with Appendix D, Data Security, that employs state of the art technology, which program will be regularly reviewed by the Chief Compliance Officer and Chief Information Security Officer;

(D) implement and maintain a mechanism to confirm the identity of all individuals permitted to access the CAT Data stored in the Central Repository and maintain a record of all instances where such CAT Data was accessed; and

(E) implement and maintain appropriate policies regarding limitations on trading activities of its employees and independent contractors involved with all CAT Data consistent with Section 6.1(n).

that: (ii) Each Participant shall adopt and enforce policies and procedures

(A) implement effective information barriers between such Participant's regulatory and non-regulatory staff with regard to access and use of CAT Data stored in the Central Repository;

(B) permit only persons designated by Participants to have access to the CAT Data stored in the Central Repository; and

(C) impose penalties for staff non-compliance with any of its or the Plan Processor's policies or procedures with respect to information security.

(iii) Each Participant shall as promptly as reasonably practicable, and in any event within 24 hours, report to the Chief Compliance Officer, in accordance with the guidance provided by the Operating Committee, any instance of which such Participant becomes aware of: (A) noncompliance with the policies and procedures adopted by such Participant pursuant to Section 6.5(e)(ii); or (B) a breach of the security of the CAT.

(iv) The Plan Processor shall:

(A) ensure data confidentiality and security during all communications between CAT Reporters and the Plan Processor, data extractions, manipulation and transformation, loading to and from the Central Repository and data maintenance by the Central Repository;

(B) require the establishment of secure controls for data retrieval and query reports by Participant regulatory staff; and

(C) otherwise provide appropriate database security for the Central Repository.

(v) The Company shall endeavor to join the FS-ISAC and comparable bodies as the Operating Committee may determine.

(g) Participants Confidentiality Policies and Procedures. The Participants shall establish, maintain and enforce written policies and procedures reasonably designed to (1) ensure the confidentiality of the CAT Data obtained from the Central Repository; and (2) limit the use of CAT Data obtained from the Central Repository solely for surveillance and regulatory purposes. Each Participant shall periodically review the effectiveness of the policies and procedures required by this paragraph, and take prompt action to remedy deficiencies in such policies and procedures.

(h) A Participant may use the Raw Data it reports to the Central Repository for regulatory, surveillance, commercial or other purposes as otherwise not prohibited by applicable law, rule or regulation.

Section 6.6. Written Assessments, Audits and Reports.

(a) One-Time Written Assessments and Reports. The Participants shall provide the SEC with the following written assessments, audits and reports:

(i) at least one (1) month prior to submitting a rule filing to establish initial fees for CAT Reporters, an independent audit of fees, costs, and expenses incurred by the Participants on behalf of the Company prior to the Effective Date of the Plan that will be publicly available;

(ii) within six (6) months of effectiveness of the Plan, an assessment of the clock synchronization standard, including consideration of industry standards based on the type of CAT Reporter, Industry Member and type of system, and propose any appropriate amendment based on this assessment;

(iii) within twelve (12) months of effectiveness of the Plan, a report detailing the Participants' consideration of coordinated surveillance (e.g., entering into 17d-2 agreements or regulatory services agreements);

(iv) within 24 months of effectiveness of the Plan, a report discussing the feasibility, benefits, and risks of allowing an Industry Member to bulk download the Raw Data it submitted to the Central Repository;

(v) within 36 months of effectiveness of the Plan, an assessment of errors in the customer information submitted to the Central Repository and whether to prioritize the correction of certain data fields over others;

(vi) within 36 months of effectiveness of the Plan, a report on the impact of tiered-fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity; and

(vii) prior to the implementation of any Material Systems Change, an assessment of the projected impact of such Material Systems Change on the maximum Error Rate.

(b) Regular Written Assessment of the Plan Processor's Performance.

(i) Requirement.

(A) Annually, or more frequently in connection with any review of the Plan Processor's performance under this Agreement pursuant to Section 6.1(n), the Participants shall provide the SEC with a written assessment of the operation of the CAT that meets the requirements of SEC Rule 613, Appendix D, and this Agreement.

(B) The Chief Compliance Officer shall oversee the assessment contemplated by Section 6.6(b)(i)(A) and shall provide the Participants a reasonable time to review and comment upon such assessment prior to its submission to the SEC. In no case shall the written assessment be changed or amended in response to a comment by a Participant; rather, any comment by a Participant shall be provided to the SEC at the same time as the written assessment.

(ii) Contents of Written Assessment. The annual written assessment required by this Section 6.6 shall include:

(A) an evaluation of the performance of the CAT, including the items specified in SEC Rule 613(b)(6)(i) and other performance metrics identified by the Chief Compliance Officer, and a description of such metrics;

(B) a detailed plan, based on the evaluation conducted pursuant to Section 6.6(b)(i), for any potential improvements to the performance of the CAT with respect to the items specified in SEC Rule 613(b)(6)(ii), as well as:

- (1) an evaluation of potential technology upgrades based on a review of technological advancements over the preceding year, drawing on technological expertise whether internal or external;
- (2) an evaluation of the time necessary to restore and recover CAT Data at a back-up site;
- (3) an evaluation of the information security program to ensure that the program is consistent with the highest industry standards for the protection of data;
- (4) an evaluation of how the Plan Processor and the Participants are monitoring Error Rates and to explore the imposition of Error Rates based on product, data elements or other criteria;
- (5) a copy of the evaluation required by Section 6.8(c) as to whether industry standards have evolved such that: (i) the synchronization standard in Section 6.8(a) should be shortened; or (ii) the required time stamp in Section 6.8(b) should be in finer increments;
- (6) an assessment of whether any data elements should be added, deleted or changed; and

(7) any other items identified and described by the Chief Compliance Officer;

(C) an estimate of the costs and benefits associated with any potential improvements to the performance of the CAT, including an assessment of the potential impact on competition, efficiency, capital formation, and investor protection; and

(D) an estimated implementation timeline for any potential improvements to the performance of the CAT, if applicable.

(c) Implementation Plan and Quarterly Progress Reports.

(i) Within 30 calendar days following the effective date of this provision, the Participants shall file with the Commission and make publicly available on each of their websites, or collectively on the CAT NMS Plan website, a complete CAT implementation plan that includes the Participants' timeline for achieving the objective milestones setting forth how and when the Participants will facilitate the achievement of Full Implementation of CAT NMS Plan Requirements (the "Implementation Plan"). The Implementation Plan shall include:

(A) For each of the objective milestones set forth in Section C.10 of Appendix C of this Agreement to assess progress toward implementation of the CAT, the completion date and a description of the status; and

(B) For each of the Financial Accountability Milestones, the completion date and a description of the status.

If the Participants decide to complete any of the milestones identified in the Implementation Plan by releasing functionality in a phased approach, the Implementation Plan shall describe each phased release necessary to achieve the completion of the relevant milestone and provide completion dates for each such release identified.

(ii) Within 30 calendar days after the end of each calendar quarter, Participants shall file with the Commission and make publicly available on each of their websites, or collectively on the CAT NMS Plan website, a complete report that provides a detailed description of the progress made by the Participants during that calendar quarter toward achieving each of the milestones set forth in the Implementation Plan (the "Quarterly Progress Report"). If, subsequent to the publication of the Implementation Plan, the Participants decide to complete any of the milestones set forth therein by releasing functionality in a phased approach, each Quarterly Progress Report shall reflect this change by describing the phases necessary to achieve the completion of the relevant milestone and providing the information specified below for each phase. The Participants shall file and make publicly available the first of such reports within 30 calendar days after the end of the calendar quarter in which the Participants filed and made publicly available the Implementation Plan.

(A) For each milestone completed by the end of a given calendar quarter, the report shall include the following: (1) the CAT

implementation plan completion date, (2) the date on which the milestone was completed, and (3) a description of any variance from the Implementation Plan.

(B) For each milestone in progress at the end of a given calendar quarter, the report shall include the following: (1) the CAT implementation plan completion date, (2) the currently targeted completion date, and (3) a description of:

(a) the current status of the milestone;

(b) any difference between the CAT implementation plan completion date and the currently targeted completion date, including the basis for making the adjustment and the impact of this adjustment on any other milestone; and

(c) any other factual indicators that demonstrate the current level of completion with respect to the milestone.

(C) For each milestone that has not yet been initiated by the end of a given calendar quarter, the report shall include the following: (1) the CAT implementation plan completion date, (2) the currently targeted completion date, and (3) a description of:

(a) the current status of the milestone; and

(b) any difference between the Implementation Plan completion date and the currently targeted completion date, including the basis for making the adjustment and the impact of this adjustment on any other milestone.

(iii) The Implementation Plan and each Quarterly Progress Report shall be approved by at least a Supermajority Vote of the Operating Committee before such documents are filed with the Commission or made publicly available on each of the Participant websites or collectively on the CAT NMS Plan website. However, if the Implementation Plan or any Quarterly Progress Report is approved only by a Supermajority Vote of the Operating Committee, and not by a unanimous vote of the Operating Committee (including, for the avoidance of doubt, all members of the Operating Committee, whether or not present and whether or not recused), each Participant whose Operating Committee member did not vote to approve the Implementation Plan or Quarterly Progress Report shall separately file with the Commission a statement identifying itself and explaining why the member did not vote to approve the Implementation Plan or Quarterly Progress Report. These statements shall be made publicly available by each dissenting Participant on its website or collectively by all Participants on the CAT NMS Plan website. The Operating Committee shall submit the Implementation Plan and Quarterly Progress Reports to the Chief Executive Officer, President, or an equivalently situated senior officer of each Participant, prior to being voted on by the Operating Committee.

Section 6.7. Implementation.

(a) Unless otherwise ordered by the SEC:

(i) within two (2) months after the Effective Date, the Participants shall jointly select the winning Shortlisted Bid and the Plan Processor pursuant to the process set forth in Article V. Following the selection of the Initial Plan Processor, the Participants shall file with the Commission a statement identifying the Plan Processor and including the information required by SEC Rule 608;

(ii) within four (4) months after the Effective Date, each Participant shall, and through its Compliance Rule shall require its Industry Members to, synchronize its or their Business Clocks as required by Section 6.8 and certify to the Chief Compliance Officer (in the case of Participants) or the applicable Participant (in the case of Industry Members) that such Participant has met this requirement;

(iii) within one (1) year after the Effective Date, each Participant shall report to the Central Repository Participant Data;

(iv) within fourteen (14) months after the Effective Date, each Participant shall implement a new or enhanced surveillance system(s) in accordance with Section 6.10;

(v) within two (2) years after the Effective Date, each Participant shall, through its Compliance Rule, require its Industry Members (other than Small Industry Members) to report to the Central Repository Industry Member Data; and

(vi) within three (3) years after the Effective Date, each Participant shall, through its Compliance Rule, require its Small Industry Members to report to the Central Repository Industry Member Data.

(b) The Chief Compliance Officer shall appropriately document objective milestones to assess progress toward the implementation of this Agreement.

(c) Industry Members and Participants shall be required to participate in testing with the Central Repository on a schedule to be determined by the Operating Committee.

(d) Appendix C, A Plan to Eliminate Existing Rules and Systems (SEC Rule 613(a)(1)(ix)), and Appendix D, Data Types and Sources, set forth additional implementation details concerning the elimination of rules and systems.

Section 6.8. Timestamps and Synchronization of Business Clocks.

(a) Each Participant shall:

(i) other than such Business Clocks used solely for Manual Order Events, synchronize its Business Clocks at a minimum to within 100 microseconds of the time

maintained by the National Institute of Standards and Technology, consistent with industry standards;

(ii) other than such Business Clocks used solely for Manual Order Events or the time of allocation on Allocation Reports, through its Compliance Rule, require its Industry Members to:

(A) synchronize their respective Business Clocks at a minimum to within fifty (50) milliseconds of the time maintained by the National Institute of Standards and Technology, and maintain such a synchronization;

(B) certify periodically (according to a schedule to be defined by the Operating Committee) that their Business Clocks meet the requirements of the Compliance Rule;

(C) and report to the Plan Processor and the Participant any violation of the Compliance Rule pursuant to the thresholds set by the Operating Committee; and

(iii) synchronize its Business Clocks and, through its Compliance Rule, require its Industry Members to synchronize their Business Clocks used solely for Manual Order Events at a minimum to within one second of the time maintained by the National Institute of Standards and Technology (“NIST”), consistent with industry standards, and maintain such synchronization. Each Participant shall require its Industry Members to certify periodically (according to a schedule defined by the Operating Committee) that their Business Clocks used solely for Manual Order Events meet the requirements of the Compliance Rule. The Compliance Rule of a Participant shall require its Industry Members using Business Clocks solely for Manual Order Events to report to the Plan Processor any violation of the Compliance Rule pursuant to the thresholds set by the Operating Committee.

(iv) through its Compliance Rule, require its Industry Members to synchronize their Business Clocks used solely for the time of allocation on Allocation Reports at a minimum to within one second of the time maintained by NIST, consistent with industry standards, and maintain such synchronization. Each Participant shall require its Industry Members to certify periodically (according to a schedule defined by the Operating Committee) that their Business Clocks used solely for the time of allocation on Allocation Reports meet the requirements of the Compliance Rule. The Compliance Rule of a Participant shall require its Industry Members using Business Clocks solely for the time of allocation on Allocation Reports to report to the Plan Processor any violation of the Compliance Rule pursuant to the thresholds set by the Operating Committee.

(b) Each Participant shall, and through its Compliance Rule shall require its Industry Members to, report information required by SEC Rule 613 and this Agreement to the Central Repository in milliseconds. To the extent that any Participant’s order handling or execution systems utilize timestamps in increments finer than the minimum required in this Agreement, such Participant shall utilize such finer increment when reporting CAT Data to the

Central Repository so that all Reportable Events reported to the Central Repository can be adequately sequenced. Each Participant shall, through its Compliance Rule: (i) require that, to the extent that its Industry Members utilize timestamps in increments finer than the minimum required in this Agreement in their order handling or execution systems, such Industry Members shall utilize such finer increment when reporting CAT Data to the Central Repository; and (ii) provide that a pattern or practice of reporting events outside of the required clock synchronization time period without reasonable justification or exceptional circumstances may be considered a violation of SEC Rule 613 and the CAT NMS Plan. Notwithstanding the preceding sentences, each Participant and Industry Member shall be permitted to record and report: (i) Manual Order Events to the Central Repository in increments up to and including one second, provided that Participants and Industry Members shall be required to record and report the time when a Manual Order Event has been captured electronically in an order handling and execution system of such Participant or Industry Member (“Electronic Capture Time”) in milliseconds; and (ii) the time of allocation on Allocation Reports in increments up to and including one second.

(c) In conjunction with Participants’ and other appropriate Industry Member advisory groups, the Chief Compliance Officer shall annually evaluate and make a recommendation to the Operating Committee as to whether industry standards have evolved such that: (i) the synchronization standard in Section 6.8(a) should be shortened; or (ii) the required time stamp in Section 6.8(b) should be in finer increments. Industry standards should be determined based on the type of CAT Reporter, Industry Member and type of system.

Section 6.9. Technical Specifications.

(a) Publication. The Plan Processor shall publish technical specifications that are at a minimum consistent with Appendices C and D, and updates thereto as needed, providing detailed instructions regarding the submission of CAT Data by Participants and Industry Members to the Plan Processor for entry into the Central Repository (collectively, the “Technical Specifications”). The Technical Specifications shall be made available on a publicly available web site to be developed and maintained by the Plan Processor. The initial Technical Specifications and any Material Amendments thereto shall be provided to the Operating Committee for approval by Supermajority Vote.

(b) Content. The Technical Specifications shall include a detailed description of the following:

(i) the specifications for the layout of files and records submitted to the Central Repository;

(ii) the process for the release of new data format specification changes;

(iii) the process for industry testing for any changes to data format specifications;

(iv) the procedures for obtaining feedback about and submitting corrections to information submitted to the Central Repository;

(v) each data element, including permitted values, in any type of report submitted to the Central Repository;

(vi) any error messages generated by the Plan Processor in the course of validating the data;

(vii) the process for file submissions (and re-submissions for corrected files);

(viii) the storage and access requirements for all files submitted;

(ix) metadata requirements for all files submitted to the CAT System;

(x) any required secure network connectivity;

(xi) data security standards, which shall, at a minimum: (A) satisfy all applicable regulations regarding database security, including provisions of Regulation Systems Compliance and Integrity under the Exchange Act (“Reg SCI”); (B) to the extent not otherwise provided for under this Agreement (including Appendix C hereto), set forth such provisions as may be necessary or appropriate to comply with SEC Rule 613(e)(4); and (C) comply with industry best practices; and

(xii) any other items reasonably deemed appropriate by the Plan Processor and approved by the Operating Committee.

(c) Amendments. Amendments to the Technical Specifications may be made only in accordance with this Section 6.9(c). For purposes of this Section 6.9(c), an amendment to the Technical Specifications shall be deemed “material” if it would require a Participant or an Industry Member to engage in significant changes to the coding necessary to submit information to the Central Repository pursuant to this Agreement or if it is required to safeguard the security or confidentiality of the CAT Data (“Material Amendment”).

(i) Except for Material Amendments to the Technical Specifications, the Plan Processor shall have the sole discretion to amend and publish interpretations regarding the Technical Specifications as needed in furtherance of the purposes and requirements of this Agreement. All non-Material Amendments made to the Technical Specifications and all published interpretations shall be provided to the Operating Committee in writing at least ten (10) days before being published. Such non-Material Amendments and published interpretations shall be deemed approved ten (10) days following provision to the Operating Committee unless two (2) unaffiliated Participants call for a vote to be taken on the proposed amendment or interpretation. If an amendment or interpretation is called out for a vote by two or more unaffiliated Participants, the proposed amendment must be approved by Majority Vote of the Operating Committee. Once a non-Material amendment has been approved, or deemed approved, by the Operating Committee, the Plan Processor shall be responsible for determining the specific changes to the Central Repository and providing technical documentation of those changes, including an implementation timeline.

(ii) The Operating Committee, by Supermajority Vote, shall approve any Material Amendments to the Technical Specifications.

(iii) The Operating Committee, by Supermajority Vote, may amend the Technical Specifications on its own motion.

Section 6.10. Surveillance.

(a) Surveillance Systems. Using the tools provided for in Appendix D, Functionality of the CAT System, each Participant shall develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the Central Repository. Unless otherwise ordered by the SEC, within fourteen (14) months after the Effective Date, each Participant shall initially implement a new or enhanced surveillance system(s) as required by SEC Rule 613 and the preceding sentence.

(b) Coordinated Surveillance. Participants may, but are not required to, coordinate or share surveillance efforts through the use of regulatory services agreements and agreements adopted pursuant to SEC Rule 17d-2.

(c) Use of CAT Data by Regulators.

(i) Consistent with Appendix D, Functionality of the CAT System, the Plan Processor shall provide Participants and the SEC with access to all CAT Data stored in the Central Repository. Regulators will have access to processed CAT Data through two different methods; an online targeted query tool, and user-defined direct queries and bulk extracts.

(A) The online targeted query tool will provide authorized users with the ability to retrieve CAT Data via an online query screen that includes the ability to choose from a variety of pre-defined selection criteria. Targeted queries must include date(s) and/or time range(s), as well as one or more of a variety of fields.

(B) The user-defined direct queries and bulk extracts will provide authorized users with the ability to retrieve CAT Data via a query tool or language that allows users to query all available attributes and data sources.

(ii) Extraction of CAT Data shall be consistent with all permission rights granted by the Plan Processor. All CAT Data returned shall be encrypted, and PII data shall be masked unless users have permission to view the CAT Data that has been requested.

(iii) The Plan Processor shall implement an automated mechanism to monitor direct query usage. Such monitoring shall include automated alerts to notify the Plan Processor of potential issues with bottlenecks or excessively long queues for queries or CAT Data extractions. The Plan Processor shall provide the Operating Committee or its designee(s) details as to how the monitoring will be accomplished and the metrics that will be used to trigger alerts.

(iv) The Plan Processor shall reasonably assist regulatory staff (including those of Participants) with creating queries.

(v) Without limiting the manner in which regulatory staff (including those of Participants) may submit queries, the Plan Processor shall submit queries on behalf of a regulatory staff (including those of Participants) as reasonably requested.

(vi) The Plan Processor shall staff a CAT help desk, as described in Appendix D, CAT Help Desk, to provide technical expertise to assist regulatory staff (including those of Participants) with questions about the content and structure of the CAT Data.

Section 6.11. Debt Securities and Primary Market Transactions. Unless otherwise ordered by the Commission, within six (6) months after the Effective Date, the Participants shall jointly provide to the SEC a document outlining how the Participants could incorporate into the CAT information with respect to equity securities that are not NMS Securities or OTC Equity Securities, including Primary Market Transactions in securities that are not NMS Securities or OTC Equity Securities and in debt securities, which document shall include details for each order and Reportable Event that may be required to be provided, which market participants may be required to provide the data, the implementation timeline, and a cost estimate.

Section 6.12. Information Security Program. The Plan Processor shall develop and maintain a comprehensive information security program for the Central Repository, to be approved and reviewed at least annually by the Operating Committee, and which contains at a minimum the specific requirements detailed in Appendix D, Data Security.

ARTICLE VII

INTENTIONALLY OMITTED

ARTICLE VIII

TAX STATUS

The Company intends to operate in a manner such that it qualifies as a “business league” within the meaning of Section 501(c)(6) of the Code. The Operating Committee shall cause the Company to: (i) make an election to be treated as a corporation for U.S. federal income tax purposes by filing Form 8832 with the Internal Revenue Service effective as of the date of formation and (ii) file with the Internal Revenue Service, Form 1024, Application for Recognition of Exemption under Section 501(a) to be treated as a “business league” as described in Section 501(c)(6) of the Code.

ARTICLE IX

RECORDS AND ACCOUNTING; REPORTS

Section 9.1. Books and Records. The Company shall maintain complete and accurate books and records of the Company in accordance with SEC Rule 17a-1, which shall be maintained and be available, in addition to any documents and information required to be

furnished to the Participants under the Act, at the office of the Plan Processor and/or such other location(s) as may be designated by the Company for examination and copying by any Participant or its duly authorized representative, at such Participant's reasonable request and at its expense during ordinary business hours for any purpose reasonably related to such Participant's involvement with the CAT NMS Plan, including for compliance and other regulatory purposes, and in compliance with such other conditions as may be reasonably established by the Operating Committee. For the avoidance of doubt, all CAT Data and other books and records of the Company shall be the property of the Company, rather than the Plan Processor, and, to the extent in the possession or control of the Plan Processor, shall be made available by the Plan Processor to the Commission upon request. Except as provided in this Section 9.1 or required by non-waivable provisions of applicable law, no Participant shall have any right to examine or copy any of the books and records of the Company.

Section 9.2. Accounting.

(a) Except as provided in Section 9.3, the Operating Committee shall maintain a system of accounting established and administered in accordance with GAAP, and all financial statements or information that may be supplied to the Participants shall be prepared in accordance with GAAP (except that unaudited statements shall be subject to year-end adjustments and need not include footnotes). The Company shall prepare and provide to each Participant (1) within 30 days after the end of each calendar month, an unaudited balance sheet, income statement, statement of cash flows and statement of changes in equity for, or as of the end of, (x) such month and (y) the portion of the then current Fiscal Year ending at the end of such month; and (2) as soon as practicable after the end of each Fiscal Year, a balance sheet, income statement, statement of cash flows and statement of changes in equity for, or as of the end of, such year, audited by an independent public accounting firm (which audited balance sheet, income statement, statement of cash flows and statement of changes in equity contemplated by this Section 9.2(a) shall be made publicly available). The Fiscal Year shall be the calendar year unless otherwise determined by the Operating Committee.

(b) In all other respects, matters concerning accounting procedures shall be determined by the Operating Committee.

Section 9.3. Tax Returns. The Operating Committee shall cause federal, state, provincial, and local income tax returns for the Company to be prepared and timely filed with the appropriate authorities.

Section 9.4. Company Funds. Pending use in the business of the Company or distribution to the Participants, the funds of the Company shall be held and/or invested in accordance with the then effective cash management and investment policy adopted by the Operating Committee.

Section 9.5. Intentionally Omitted.

Section 9.6. Confidentiality.

(a) For purposes of this Agreement, "Information" means information disclosed by or on behalf of the Company or a Participant (the "Disclosing Party") to the

Company or any other Participant (the “Receiving Party”) in connection with this Agreement or the CAT System, but excludes any CAT Data or information otherwise disclosed pursuant to the requirements of SEC Rule 613. The Receiving Party agrees to maintain the Information in confidence with the same degree of care it holds its own confidential information (but in any event not less than reasonable care). A Receiving Party may only disclose Information to its Representatives (as defined below) on a need-to-know basis, and only to those of such Representatives whom shall have agreed to abide by the non-disclosure and non-use provisions in this Section 9.6. Each Receiving Party that is a Participant agrees that he, she or it shall not use for any purpose, other than in connection with the operation of the Company, and the Company agrees not to use for any purpose not expressly authorized by the Disclosing Party, any Information. The “Representatives” of a Person are such Person’s Affiliates and the respective directors, managers, officers, employees, consultants, advisors and agents of such Person and such Person’s Affiliates; provided, however, that a Participant is not a Representative of the Company. The obligations set forth in this Section 9.6(a) shall survive indefinitely (including after a Participant ceases to hold any Company Interest) but shall not apply to: (i) any Information that was already lawfully in the Receiving Party’s possession and, to the knowledge of the Receiving Party, free from any confidentiality obligation to the Disclosing Party at the time of receipt from the Disclosing Party; (ii) any Information that is, now or in the future, public knowledge through no act or omission in breach of this Agreement by the Receiving Party; (iii) any Information that was lawfully obtained from a third party having, to the knowledge of the Receiving Party, the right to disclose it free from any obligation of confidentiality; or (iv) any Information that was independently developed by the Receiving Party prior to disclosure to it pursuant hereto and without recourse to or reliance upon Information disclosed to it pursuant hereto as established by its written records or other competent evidence. The obligations set forth in this Section 9.6(a) shall not restrict: (x) disclosures that are, in the opinion of the Receiving Party after consultation with counsel; required to be made by applicable laws and regulations, stock market or exchange requirements or the rules of any self-regulatory organization having jurisdiction; (y) disclosures required to be made pursuant to an order, subpoena or legal process; or (z) disclosures reasonably necessary for the conduct of any litigation or arbitral proceeding among the Participants (and their respective Representatives) and/or the Company; provided that the Receiving Party shall, to the extent not prohibited by applicable law, notify the Disclosing Party prior to making any disclosure permitted by the foregoing clause (x) or clause (y), and, in the case of a disclosure permitted by the foregoing clause (y), shall consult with the Disclosing Party with respect to such disclosure, and prior to making such disclosure, to the extent not prohibited by applicable law, shall permit the Disclosing Party, at such Disclosing Party’s cost and expense, to seek a protective order or similar relief protecting the confidentiality of such Information.

(b) The Company shall not, and shall cause its Representatives not to, disclose any Information of a Participant to any other Participant without the prior written approval of the disclosing Participant.

(c) A Participant shall be free, in its own discretion, to share Information of such Participant to other Participants without the approval of the Company.

ARTICLE X

DISSOLUTION AND TERMINATION

Section 10.1. Dissolution of Company. The Company shall, subject to the SEC's approval, dissolve and its assets and business shall be wound up upon the occurrence of any of the following events:

- (a) unanimous written consent of the Participants to dissolve the Company;
- (b) an event that makes it unlawful or impossible for the Company business to be continued;
- (c) the termination of one or more Participants such that there is only one remaining Participant; or
- (d) the entry of a decree of judicial dissolution under Section 18-802 of the Delaware Act.

Section 10.2. Liquidation and Distribution. Following the occurrence of an event described in Section 10.1, the Operating Committee shall act as liquidating trustee and shall wind up the affairs of the Company by: (a) selling its assets in an orderly manner (so as to avoid the loss normally associated with forced sales); and (b) applying and distributing the proceeds of such sale, together with other funds held by the Company: (i) first, to the payment of all debts and liabilities of the Company; (ii) second, to the establishments of any reserves reasonably necessary to provide for any contingent recourse liabilities and obligations; and (iii) third, to such persons or institutions as is consistent with the purposes of the Company and consistent with Section 501(c)(6) of the Code.

Section 10.3. Termination. Each of the Participants shall be furnished with a statement prepared by the Company's independent accountants, which shall set forth the assets and liabilities of the Company as of the date of the final distribution of the Company's assets under Section 10.2 and the net profit or net loss for the fiscal period ending on such date. Upon compliance with the distribution plan set forth in Section 10.2, the Participants shall cease to be such, and the liquidating trustee shall execute, acknowledge, and cause to be filed a certificate of cancellation of the Company. Upon completion of the dissolution, winding up, liquidation and distribution of the liquidation proceeds, the Company shall terminate.

ARTICLE XI

FUNDING OF THE COMPANY

Section 11.1. Funding Authority.

- (a) On an annual basis the Operating Committee shall approve an operating budget for the Company. The budget shall include the projected costs of the Company, including the costs of developing and operating the CAT for the upcoming year, and the sources

of all revenues to cover such costs, as well as the funding of any reserve that the Operating Committee reasonably deems appropriate for prudent operation of the Company.

(b) Subject to Section 11.2, the Operating Committee shall have discretion to establish funding for the Company, including: (i) establishing fees that the Participants shall pay; and (ii) establishing fees for Industry Members that shall be implemented by Participants. The Participants shall file with the SEC under Section 19(b) of the Exchange Act any such fees on Industry Members that the Operating Committee approves, and such fees shall be labeled as “Consolidated Audit Trail Funding Fees.”

(c) To fund the development and implementation of the CAT, the Company shall time the imposition and collection of all fees on Participants and Industry Members in a manner reasonably related to the timing when the Company expects to incur such development and implementation costs. In determining fees on Participants and Industry Members the Operating Committee shall take into account fees, costs and expenses (including legal and consulting fees and expenses) incurred by the Participants on behalf of the Company prior to the Effective Date in connection with the creation and implementation of the CAT, and such fees, costs and expenses shall be fairly and reasonably shared among the Participants and Industry Members. Any surplus of the Company’s revenues over its expenses shall be treated as an operational reserve to offset future fees.

(d) Consistent with this Article XI, the Operating Committee shall adopt policies, procedures, and practices regarding the budget and budgeting process, assignment of tiers, resolution of disputes, billing and collection of fees, and other related matters. For the avoidance of doubt, as part of its regular review of fees for the CAT, the Operating Committee shall have the right to change the tier assigned to any particular Person in accordance with fee schedules previously filed with the Commission that are reasonable, equitable and not unfairly discriminatory and subject to public notice and comment, pursuant to this Article XI. Any such changes will be effective upon reasonable notice to such Person.

Section 11.2. Funding Principles. In establishing the funding of the Company, the Operating Committee shall seek:

(a) to create transparent, predictable revenue streams for the Company that are aligned with the anticipated costs to build, operate and administer the CAT and the other costs of the Company;

(b) to establish an allocation of the Company’s related costs among Participants and Industry Members that is consistent with the Exchange Act, taking into account the timeline for implementation of the CAT and distinctions in the securities trading operations of Participants and Industry Members and their relative impact upon Company resources and operations;

(c) to establish a tiered fee structure in which the fees charged to: (i) CAT Reporters that are Execution Venues, including ATs, are based upon the level of market share; (ii) Industry Members’ non-ATS activities are based upon message traffic; and (iii) the CAT Reporters with the most CAT-related activity (measured by market share and/or message traffic,

as applicable) are generally comparable (where, for these comparability purposes, the tiered fee structure takes into consideration affiliations between or among CAT Reporters, whether Execution Venues and/or Industry Members).

- (d) to provide for ease of billing and other administrative functions;
- (e) to avoid any disincentives such as placing an inappropriate burden on competition and a reduction in market quality; and
- (f) to build financial stability to support the Company as a going concern.

Section 11.3. Recovery.

(a) The Operating Committee will establish fixed fees to be payable by Execution Venues as provided in this Section 11.3(a):

(i) Each Execution Venue that: (A) executes transactions; or (B) in the case of a national securities association, has trades reported by its members to its trade reporting facility or facilities for reporting transactions effected otherwise than on an exchange, in NMS Stocks or OTC Equity Securities will pay a fixed fee depending on the market share of that Execution Venue in NMS Stocks and OTC Equity Securities, with the Operating Committee establishing at least two and no more than five tiers of fixed fees, based on an Execution Venue's NMS Stocks and OTC Equity Securities market share. For these purposes, market share for Execution Venues that execute transactions will be calculated by share volume, and market share for a national securities association that has trades reported by its members to its trade reporting facility or facilities for reporting transactions effected otherwise than on an exchange in NMS Stocks or OTC Equity Securities will be calculated based on share volume of trades reported, provided, however, that the share volume reported to such national securities association by an Execution Venue shall not be included in the calculation of such national security association's market share.

(ii) Each Execution Venue that executes transactions in Listed Options will pay a fixed fee depending on the Listed Options market share of that Execution Venue, with the Operating Committee establishing at least two and no more than five tiers of fixed fees, based on an Execution Venue's Listed Options market share. For these purposes, market share will be calculated by contract volume.

(b) The Operating Committee will establish fixed fees to be payable by Industry Members, based on the message traffic generated by such Industry Member, with the Operating Committee establishing at least five and no more than nine tiers of fixed fees, based on message traffic. For the avoidance of doubt, the fixed fees payable by Industry Members pursuant to this paragraph shall, in addition to any other applicable message traffic, include message traffic generated by: (i) an ATS that does not execute orders that is sponsored by such Industry Member; and (ii) routing orders to and from any ATS sponsored by such Industry Member.

(c) The Operating Committee may establish any other fees ancillary to the operation of the CAT that it reasonably determines appropriate, including fees: (i) for the late or

inaccurate reporting of information to the CAT; (ii) for correcting submitted information; and (iii) based on access and use of the CAT for regulatory and oversight purposes (and not including any reporting obligations).

(d) The Company shall make publicly available a schedule of effective fees and charges adopted pursuant to this Agreement as in effect from time to time. The Operating Committee shall review such fee schedule on at least an annual basis and shall make any changes to such fee schedule that it deems appropriate. The Operating Committee is authorized to review such fee schedule on a more regular basis, but shall not make any changes on more than a semi-annual basis unless, pursuant to a Supermajority Vote, the Operating Committee concludes that such change is necessary for the adequate funding of the Company.

Section 11.4. Collection of Fees. The Operating Committee shall establish a system for the collection of fees authorized under this Article XI. The Operating Committee may include such collection responsibility as a function of the Plan Processor or another administrator. Alternatively, the Operating Committee may use the facilities of a clearing agency registered under Section 17A of the Exchange Act to provide for the collection of such fees. Participants shall require each Industry Member to pay all applicable fees authorized under this Article XI within thirty (30) days after receipt of an invoice or other notice indicating payment is due (unless a longer payment period is otherwise indicated). If an Industry Member fails to pay any such fee when due (as determined in accordance with the preceding sentence), such Industry Member shall pay interest on the outstanding balance from such due date until such fee is paid at a per annum rate equal to the lesser of: (a) the Prime Rate plus 300 basis points; or (b) the maximum rate permitted by applicable law. Each Participant shall pay all applicable fees authorized under this Article XI as required by Section 3.7(b).

Section 11.5. Fee Disputes. Disputes with respect to fees the Company charges Participants pursuant to this Article XI shall be determined by the Operating Committee or a Subcommittee designated by the Operating Committee. Decisions by the Operating Committee or such designated Subcommittee on such matters shall be binding on Participants, without prejudice to the rights of any Participant to seek redress from the SEC pursuant to SEC Rule 608 or in any other appropriate forum. The Participants shall adopt rules requiring that disputes with respect to fees charged to Industry Members pursuant to this Article XI be determined by the Operating Committee or a Subcommittee. Decisions by the Operating Committee or Subcommittee on such matters shall be binding on Industry Members, without prejudice to the rights of any Industry Member to seek redress from the SEC pursuant to SEC Rule 608 or in any other appropriate forum.

Section 11.6. Funding Incentives for Post-Amendment Expenses. Notwithstanding the foregoing provisions, this Section shall apply with respect to all fees, costs, and expenses (including legal and consulting fees, costs, and expenses) incurred by or for the Company in connection with the development, implementation, and operation of the CAT from the effective date of this Section until such time as Full Implementation of CAT NMS Plan Requirements has been achieved ("Post-Amendment Expenses").

(a) The following conditions shall apply to the collection of any fees established by the Operating Committee or implemented by the Participants to recover a portion

of Post-Amendment Expenses from Industry Members (“Post-Amendment Industry Member Fees”).

(i) The Participants will be entitled to collect the full amount of:

(A) Any Post-Amendment Industry Member Fees established or implemented to recover Post-Amendment Expenses incurred from the effective date of this Section to the date of Initial Industry Member Core Equity and Option Reporting (“Period 1”), so long as such date is no later than July 31, 2020;

(B) Any Post-Amendment Industry Member Fees established or implemented to recover the Post-Amendment Expenses incurred from the date immediately following the achievement of Initial Industry Member Core Equity and Option Reporting to the date of Full Implementation of Core Equity Reporting (“Period 2”), so long as such date is no later than December 31, 2020;

(C) Any Post-Amendment Industry Member Fees established or implemented to recover the Post-Amendment Expenses incurred from the date immediately following the achievement of Full Implementation of Core Equity Reporting to the date of Full Availability and Regulatory Utilization of Transactional Database Functionality (“Period 3”), so long as such date is no later than December 31, 2021; and

(D) Any Post-Amendment Industry Member Fees established or implemented to recover the Post-Amendment Expenses incurred from the date immediately following the achievement of Full Availability and Regulatory Utilization of Transactional Database Functionality to the date of Full Implementation of CAT NMS Plan Requirements (“Period 4”), so long as such date is no later than December 30, 2022.

(ii) The amount of Post-Amendment Industry Member Fees that the Participants are entitled to collect for Period 1 will be reduced according to the following schedule if the Participants miss the deadline set forth for that Period:

(A) By 25% if the Participants miss the deadline set forth in Section 11.6(a)(i)(A) by less than 45 days;

(B) By 50% if the Participants miss the deadline set forth in Section 11.6(a)(i)(A) by 45 days or more, but less than 90 days;

(C) By 75% if the Participants miss the deadline set forth in Section 11.6(a)(i)(A) by 90 days or more, but less than 135 days; and

(D) By 100% if the Participants miss the deadline set forth in Section 11.6(a)(i)(A) by 135 days or more.

(iii) The amount of Post-Amendment Industry Member Fees that the Participants are entitled to collect for Periods 2, 3, and 4 will be reduced according to the following schedule if the Participants miss the deadline set forth for that Period:

(A) By 25% if the Participants miss the deadline set forth in Section 11.6(a)(i)(B)-(D) by less than 90 days;

(B) By 50% if the Participants miss the deadline set forth in Section 11.6(a)(i)(B)-(D) by 90 days or more, but less than 180 days;

(C) By 75% if the Participants miss the deadline set forth in Section 11.6(a)(i)(B)-(D) by 180 days or more, but less than 270 days; and

(D) By 100% if the Participants miss the deadline set forth in Section 11.6(a)(i)(B)-(D) by 270 days or more.

(iv) The Participants will only be permitted to collect Post-Amendment Industry Member Fees for Period 1, Period 2, Period 3, or Period 4 at the end of each respective Period.

(b) In all CAT NMS Plan amendments submitted by the Operating Committee to the Commission pursuant to Rule 608(b)(3)(i), and in all filings submitted by the Participants to the Commission under Section 19(b) of the Exchange Act, to establish or implement Post-Amendment Industry Member Fees pursuant to this Article, the Operating Committee or the Participants shall clearly indicate whether such fees are related to Post-Amendment Expenses incurred during Period 1, Period 2, Period 3, or Period 4.

ARTICLE XII

MISCELLANEOUS

Section 12.1. Notices and Addresses. All notices required to be given under this Agreement shall be in writing and may be delivered by certified or registered mail, postage prepaid, by hand, or by any private overnight courier service. Such notices shall be mailed or delivered to the Participants at the addresses set forth on Exhibit A to this Agreement or such other address as a Participant may notify the other Participants of in writing. Any notices to be sent to the Company shall be delivered to the principal place of business of the Company or at such other address as the Operating Committee may specify in a notice sent to all of the Participants. Notices shall be effective: (i) if mailed, on the date three (3) days after the date of mailing; or (ii) if hand delivered or delivered by private courier, on the date of delivery.

Section 12.2. Governing Law; Submission to Jurisdiction. This Agreement shall be governed by and construed in accordance with the Delaware Act and internal laws and decisions of the State of Delaware without giving effect to any choice or conflict of law provision or rule (whether of the State of Delaware or any other jurisdiction) that would cause the application of laws of any jurisdictions other than those of the State of Delaware; provided that the rights and obligations of the Participants, Industry Members and other Persons contracting with the Company in respect of the matters covered by this Agreement shall at all times also be subject to

any applicable provisions of the Exchange Act and any rules and regulations promulgated thereunder. Each of the Company and the Participants: (a) consents to submit itself to the exclusive personal jurisdiction of the Court of Chancery of the State of Delaware, New Castle County, or, if that court does not have jurisdiction, a federal court sitting in Wilmington, Delaware in any action or proceeding arising out of or relating to this Agreement or any of the transactions contemplated by this Agreement; (b) agrees that all claims in respect of such action or proceeding shall be heard and determined only in any such court; (c) agrees that it shall not attempt to deny or defeat such personal jurisdiction by motion or other request for leave from any such court; and (d) agrees not to bring any action or proceeding arising out of or relating to this Agreement or any of the transaction contemplated by this Agreement in any other court. Each of the Company and the Participants waives any defense of inconvenient forum to the maintenance of any action or proceeding so brought and waives any bond, surety or other security that might be required of any other Person with respect thereto. The Company or any Participant may make service on the Company or any other Participant by sending or delivering a copy of the process to the party to be served at the address and in the manner provided for the giving of notices in Section 12.1. Nothing in this Section 12.2, however, shall affect the right of any Person to serve legal process in any other manner permitted by law.

Section 12.3. Amendments. Except as provided by Section 3.3, Section 3.4, Section 3.7, and Section 5.3, this Agreement may be amended from time to time only by a written amendment authorized by the affirmative vote of not less than two-thirds of all of the Participants or with respect to Section 3.8 by the affirmative vote of all of the Participants, in each case that has been approved by the SEC pursuant to SEC Rule 608 or has otherwise become effective under SEC Rule 608. Notwithstanding the foregoing or anything else to the contrary, to the extent the SEC grants exemptive relief applicable to any provision of this Agreement, Participants and Industry Members shall be entitled to comply with such provision pursuant to the terms of the exemptive relief so granted at the time such relief is granted irrespective of whether this Agreement has been amended.

Section 12.4. Successors and Assigns. Subject to the restrictions on Transfers set forth herein, this Agreement: (a) shall be binding upon, and inure to the benefit of, the Company and the Participants, and their respective successors and permitted assigns; and (b) may not be assigned except in connection with a Transfer of Company Interests permitted hereunder.

Section 12.5. Counterparts. This Agreement may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall constitute one instrument. Any counterpart may be delivered by facsimile transmission or by electronic communication in portable document format (.pdf) or tagged image format (.tif), and the parties hereto agree that their electronically transmitted signatures shall have the same effect as manually transmitted signatures.

Section 12.6. Modifications to be in Writing; Waivers. This Agreement constitutes the entire understanding of the parties hereto with respect to the subject matter hereof, and no amendment, modification or alteration shall be binding unless the same is in writing and adopted in accordance with Section 12.3. No waiver of any provision of this Agreement shall be valid unless the same shall be in writing and signed by each Person granting the waiver. No waiver by any Person of any default or breach hereunder, whether intentional or not, shall be deemed to

extend to any prior or subsequent default or breach or affect in any way any rights arising by virtue of any prior or subsequent such occurrence.

Section 12.7. Captions. The captions are inserted for convenience of reference only and shall not affect the construction of this Agreement.

Section 12.8. Validity and Severability. If any provision of this Agreement shall be held invalid or unenforceable, that shall not affect the validity or enforceability of any other provisions of this Agreement, all of which shall remain in full force and effect. If the final judgment of a court of competent jurisdiction declares that any term or provision hereof is invalid or unenforceable, each of the Company and the Participants agrees that the body making the determination of invalidity or unenforceability shall have the power to reduce the scope, duration or area of the term or provision, to delete specific words or phrases, or to replace any invalid or unenforceable term or provision with a term or provision that is valid and enforceable and that comes closest to expressing the intention of the invalid or unenforceable term or provision, and this Agreement shall be enforceable as so modified.

Section 12.9. Third Party Beneficiaries. Except to the extent provided in any separate written agreement between the Company and another Person, the provisions of this Agreement are not intended to be for the benefit of any creditor or other Person (other than a Participant in its capacity as such) to whom any debts, liabilities or obligations are owed by (or who otherwise has any claim against) the Company or any Participants. Moreover, notwithstanding anything contained in this Agreement (but subject to the immediately following sentence), no such creditor or other Person shall obtain any rights under this Agreement or shall, by reason of this Agreement, make any claim in respect of any debt, liability or obligation (or otherwise) against the Company or any Participant. Notwithstanding the foregoing provisions of this Section 12.9, each Person entitled to indemnification under Section 4.8 that is not a party to this Agreement shall be deemed to be an express third party beneficiary of this Agreement for all purposes relating to such Person's indemnification and exculpation rights hereunder.

Section 12.10. Expenses. Except as may be otherwise specifically provided to the contrary in this Agreement, including in Article XI, or as may be otherwise determined by the Operating Committee, each of the Company and the Participants shall bear its own internal costs and expenses incurred in connection with this Agreement, including those incurred in connection with all periodic meetings of the Participants or the Operating Committee, and the transactions contemplated hereby.

Section 12.11. Specific Performance. Each of the Company and the Participants acknowledges and agrees that one or more of them would be damaged irreparably in the event any of the provisions of this Agreement are not performed in accordance with their specific terms or otherwise are breached. Accordingly, each such Person agrees that each other such Person may be entitled to an injunction or injunctions to prevent breaches of the provisions of this Agreement and to enforce specifically this Agreement and the terms and provisions hereof in any action instituted in any court having jurisdiction over the Parties and the matter, in each case with no need to post bond or other security.

Section 12.12. Waiver of Partition. Each Participant agrees that irreparable damage would be done to the Company if any Participant brought an action in court to partition the assets or properties of the Company. Accordingly, each Participant agrees that such Person shall not, either directly or indirectly, take any action to require partition or appraisal of the Company or of any of the assets or properties of the Company, and notwithstanding any provisions of this Agreement to the contrary, each Participant (and such Participant's successors and permitted assigns) accepts the provisions of this Agreement as such Person's sole entitlement on termination, dissolution and/or liquidation of the Company and hereby irrevocably waives any and all right to maintain any action for partition or to compel any sale or other liquidation with respect to such Person's interest, in or with respect to, any assets or properties of the Company. Each Participant agrees not to petition a court for the dissolution, termination or liquidation of the Company.

Section 12.13. Construction. The Company and all Participants have participated jointly in negotiating and drafting this Agreement. If an ambiguity or a question of intent or interpretation arises, this Agreement shall be construed as if drafted jointly by the Company and all Participants, and no presumption or burden of proof shall arise favoring or disfavoring any Person by virtue of the authorship of any provision of this Agreement.

Section 12.14. Incorporation of Exhibits, Appendices, Attachments, Recitals and Schedules. The Exhibits, Appendices, Attachments, Recitals and Schedules identified in this Agreement are incorporated herein by reference and made a part hereof.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Participants have executed this Limited Liability Company Agreement as of the day and year first above written.

PARTICIPANTS:

BOX EXCHANGE LLC

By: _____

Name: _____

Title: _____

CBOE BYX EXCHANGE, INC.

By: _____

Name: _____

Title: _____

CBOE BZX EXCHANGE, INC.

By: _____

Name: _____

Title: _____

CBOE EDGA EXCHANGE, INC.

By: _____

Name: _____

Title: _____

CBOE EDGX EXCHANGE, INC.

By: _____

Name: _____

Title: _____

CBOE C2 EXCHANGE, INC.

By: _____

Name: _____

Title: _____

CBOE EXCHANGE, INC.

By: _____

Name: _____

Title: _____

**FINANCIAL INDUSTRY REGULATORY AUTHORITY,
INC.**

By: _____

Name: _____

Title: _____

INVESTORS' EXCHANGE, LLC

By: _____

Name: _____

Title: _____

LONG-TERM STOCK EXCHANGE, LLC

By: _____

Name: _____

Title: _____

MEMX LLC

By: _____

Name: _____

Title: _____

MIAX EMERALD, LLC

By: _____

Name: _____

Title: _____

MIAMI INTERNATIONAL SECURITIES EXCHANGE LLC

By: _____

Name: _____

Title: _____

MIAX PEARL, LLC

By: _____

Name: _____

Title: _____

NASDAQ BX, INC.

By: _____

Name: _____

Title: _____

NASDAQ GEMX, LLC

By: _____

Name: _____

Title: _____

NASDAQ ISE, LLC

By: _____

Name: _____

Title: _____

NASDAQ MRX, LLC

By: _____

Name: _____

Title: _____

NASDAQ PHLX LLC

By: _____

Name: _____

Title: _____

THE NASDAQ STOCK MARKET LLC

By: _____

Name: _____

Title: _____

NEW YORK STOCK EXCHANGE LLC

By: _____

Name: _____

Title: _____

NYSE AMERICAN LLC

By: _____

Name: _____

Title: _____

NYSE ARCA, INC.

By: _____

Name: _____

Title: _____

NYSE CHICAGO, INC.

By: _____

Name: _____

Title: _____

NYSE NATIONAL, INC.

By: _____

Name: _____

Title: _____

EXHIBIT A

PARTICIPANTS IN CONSOLIDATED AUDIT TRAIL, LLC

Cboe BZX Exchange, Inc. 400 South LaSalle St. Chicago, IL 60605	Cboe BYX Exchange, Inc. 400 South LaSalle St. Chicago, IL 60605	Cboe Exchange, Inc. 400 South LaSalle St. Chicago, IL 60605
Cboe C2 Exchange, Inc. 400 South LaSalle St. Chicago, IL 60605	Cboe EDGA Exchange, Inc. 400 South LaSalle St. Chicago, IL 60605	Cboe EDGX Exchange, Inc. 400 South LaSalle St. Chicago, IL 60605
BOX Exchange LLC 101 Arch St., Suite 610 Boston, MA 02110	New York Stock Exchange LLC 11 Wall St. New York, NY 10005	NYSE Chicago, Inc. 440 South LaSalle St., Suite 800 Chicago, IL 60605
NYSE National, Inc. 11 Wall St. New York, NY 10005	NYSE American LLC 11 Wall St. New York, NY 10005	NYSE Arca, Inc. 11 Wall St. New York, NY 10005
NASDAQ GEMX, LLC One Liberty Plaza 165 Broadway New York, NY 10006	NASDAQ ISE, LLC One Liberty Plaza 165 Broadway New York, NY 10006	NASDAQ MRX, LLC 60 Broad Street New York, NY 10004
NASDAQ BX, Inc. One Liberty Plaza 165 Broadway New York, NY 10006	NASDAQ PHLX LLC One Liberty Plaza 165 Broadway New York, NY 10006	The NASDAQ Stock Market LLC One Liberty Plaza 165 Broadway New York, NY 10006
Financial Industry Regulatory Authority, Inc. 1735 K Street, NW Washington DC, 20006	Investors' Exchange, LLC 3 World Trade Center, 58th Floor New York, NY 10007	Miami International Securities Exchange LLC 7 Roszel Road, 5th floor Princeton, NJ 08540
MIAX PEARL, LLC 7 Roszel Road, 5th Floor, Princeton, New Jersey 08540	MIAX Emerald, LLC 7 Roszel Road, 5th Floor Princeton, New Jersey 08540	Long-Term Stock Exchange, Inc. 300 Montgomery Street, Suite 300, San Francisco, CA 94104
MEMX LLC 111 Town Square Place Suite 520 Jersey City, NJ 07310		

APPENDIX A

**Consolidated Audit Trail National Market System Plan Request for Proposal, issued
February 26, 2013, version 3.0 updated March 3, 2014**

(The Request for Proposal is available at Securities Exchange Act Release No. 77724 (CAT
NMS Plan published for comment on May 17, 2016))

Certain provisions of Articles I-XII have been modified as noted on the cover page of this CAT NMS Plan. To the extent text in the following Appendices conflicts with any such modifications, the modified language of Articles I-XII shall control

APPENDIX B

[Reserved]

APPENDIX C

DISCUSSION OF CONSIDERATIONS

SEC RULE 613(A)(1) CONSIDERATIONS

SEC Rule 613(a) requires the Participants to discuss various “considerations” related to how the Participants propose to implement the requirements of the CAT NMS Plan, cost estimates for the proposed solution, and a discussion of the costs and benefits of alternate solutions considered but not proposed.² This Appendix C discusses the considerations identified in SEC Rule 613(a). The first section below provides a background of the process the Participants have undertaken to develop and draft the CAT NMS Plan. Section A below addresses the requirements, set forth in SEC Rule 613(a)(1)(i) through (a)(1)(vi), that the “Participants specify and explain the choices they made to meet the requirements specified in [SEC Rule 613] for the [CAT].”³ In many instances, details of the requirements (i.e., the specific technical requirements that the Plan Processor must meet) will be set forth in the Plan Processor Requirements document (“PPR”). Relevant portions of the PPR are outlined and described throughout this Appendix C, as well as included as Appendix D.

Section B below discusses the requirements in SEC Rule 613(a)(1)(vii) and SEC Rule 613(a)(1)(viii) that the CAT NMS Plan include detailed estimates of the costs, and the impact on competition, efficiency, and capital formation, for creating, implementing, and maintaining the CAT. The information in Section B below is intended to aid the Commission in its economic analysis of the CAT and the CAT NMS Plan.⁴

Section C below, in accordance with SEC Rule 613(a)(1)(x), establishes objective milestones to assess the Participants’ progress toward the implementation of the CAT in accordance with the CAT NMS Plan. This section includes a plan to eliminate existing rules and systems (or components thereof) that will be rendered duplicative by the CAT, as required by SEC Rule 613(a)(1)(ix).

Section D below addresses how the Participants solicited the input of their Industry Members and other appropriate parties in designing the CAT NMS Plan as required by SEC Rule 613(a)(1)(xi).

Capitalized terms used and not otherwise defined in this Appendix C have the respective meanings ascribed to such terms in the Agreement to which this Appendix C is attached.

BACKGROUND

SEC Rule 613 requires the Participants to jointly file a national market system plan to govern the creation, implementation, and maintenance of the CAT, and the Central Repository.

² Securities Exchange Act Release No. 67457 (July 18, 2012), 77 Fed. Reg. 45722, 45789 (Aug. 1, 2012) (“Adopting Release”).

³ See Adopting Release at 45790. Section B below includes discussions of reasonable alternatives to approaching the creation, implementation, and maintenance of the CAT that the Participants considered. See SEC Rule 613(a)(1)(xii).

⁴ See Adopting Release at 45793.

Early in the process, the Participants concluded that the publication of a request for proposal soliciting Bids from interested parties to serve as the Plan Processor for the CAT was necessary prior to filing the CAT NMS Plan to ensure that potential alternative solutions to creating the CAT could be presented and considered by the Participants and that a detailed and meaningful cost/benefit analysis could be performed, both of which are required considerations to be addressed in the CAT NMS Plan. To that end, the Participants published the RFP on February 26, 2013,⁵ and 31 firms formally notified the Participants of their intent to bid.

On September 3, 2013, the Participants filed with the Commission the Selection Plan, a national market system plan to govern the process for Participant review of the Bids submitted in response to the RFP, the procedure for evaluating the Bids, and, ultimately, selection of the Plan Processor. Several critical components of the Participants' process for formulating and drafting the CAT NMS Plan were contingent upon approval of the Selection Plan, which occurred on February 21, 2014.⁶ Bids in response to the RFP were due four weeks following approval of the Selection Plan, on March 21, 2014. Ten Bids were submitted in response to the RFP.

The Participants considered each Bid in great detail to ensure that the Participants can address the considerations enumerated in SEC Rule 613, including analysis of the costs and benefits of the proposed solution(s), as well as alternative solutions considered but not proposed, so that the Commission and the public will have sufficiently detailed information to carefully consider all aspects of the CAT NMS Plan the Participants ultimately submit. Soon after receiving the Bids, and pursuant to the Selection Plan, the Participants determined that all ten Bids were "qualified" pursuant to the Selection Plan.⁷ On July 1, 2014, after the Participants had hosted Bidder presentations to learn additional details regarding the Bids and conducted an analysis and comparison of the Bids, the Participants voted to select six Shortlisted Bidders.

Under the terms of the Selection Plan, and as incorporated into the CAT NMS Plan, the Plan Processor for the CAT has not been selected and will not be selected until after approval of the CAT NMS Plan.⁸ Any one of the six remaining Shortlisted Bidders could be selected as the Plan Processor, and because each Shortlisted Bidder has proposed different approaches to various issues, the CAT NMS Plan does not generally mandate specific technical approaches; rather, it mandates specific requirements that the Plan Processor must meet, regardless of approach. Where possible, this Appendix C discusses specific technical requirements the Participants have deemed necessary for the CAT; however, in some instances, provided the Plan Processor meets certain general obligations, the specific approach taken in implementing aspects of the CAT NMS Plan will be dependent upon the Bidder ultimately selected as the Plan Processor.

⁵ The initial RFP was amended in March 2014. *See* Consolidated Audit Trail National Market System Plan Request for Proposal (last updated Mar. 3, 2014), *available at* <http://catnmsplan.com/web/groups/catnms/documents/catnms/p213400.zip> (the "RFP").

⁶ The SEC has approved two amendments to the Selection Plan. *See* Securities Exchange Act Rel. No. 75192 (June 17, 2015), 80 Fed. Reg. 36028 (June 23, 2015); and Securities Exchange Act Rel. No. 75980 (Sept. 24, 2015), 80 Fed. Reg. 58796 (Sept. 30, 2015).

⁷ *See* Selection Plan, 78 Fed. Reg. 69910, Ex. A §§ I(Q) (defining "Qualified Bid"), VI(A) (providing the process for determining whether Bids are determined to be "Qualified Bids").

⁸ *See* Selection Plan § 6; *see also id.* Article V.

SEC Rule 613 also includes provisions to facilitate input on the implementation, operation, and administration of the Central Repository from the broker-dealer industry.⁹ To this end, the Participants formed a Development Advisory Group (“DAG”) to solicit industry feedback. Following multiple discussions between the Participants and both the DAG and the Bidders, as well as among the Participants themselves, the Participants recognized that some provisions of SEC Rule 613 would not permit certain solutions to be included in the CAT NMS Plan that the Participants determined advisable to effectuate the most efficient and cost-effective CAT. Consequently, the Participants submitted their original Exemptive Request Letter seeking exemptive relief from the Commission with respect to certain provisions of SEC Rule 613 regarding (1) options market maker quotes; (2) Customer-IDs; (3) CAT-Reporter-IDs; (4) linking of executions to specific subaccount allocations on allocation reports; and (5) timestamp granularity for Manual Order Events.¹⁰ Specifically, the Participants requested that the Commission grant an exemption from:

- Rule 613(c)(7)(ii) and (iv) for options market makers with regard to their options quotes.
- Rule 613(c)(7)(i)(A), (c)(7)(iv)(F), (c)(7)(viii)(B) and (c)(8) which relate to the requirements for Customer-IDs.¹¹
- Rule 613(c)(7)(i)(C), (c)(7)(ii)(D), (c)(7)(ii)(E), (c)(7)(iii)(D), (c)(7)(iii)(E), (c)(7)(iv)(F), (c)(7)(v)(F), (c)(7)(vi)(B) and (c)(8) which relate to the requirements for CAT-Reporter-IDs.
- Rule 613(c)(7)(vi)(A), which requires CAT Reporters to record and report the account number of any subaccounts to which the execution is allocated.
- The millisecond timestamp granularity requirement in Rule 613(d)(3) for certain Manual Order Events subject to timestamp reporting under Rules 613(c)(7)(i)(E), 613(c)(7)(ii)(C), 613(c)(7)(iii)(C), and 613(c)(7)(iv)(C).

The Participants supplemented their original Exemptive Request Letter with a supplemental Exemptive Request Letter (together, the “Exemptive Request Letters”), clarifying its original requested exemption from the requirement in Rule 613(c)(7)(viii)(B) (including, in some instances, requesting an exemption from the requirement to provide an account number, account

⁹ See SEC Rules 613(a)(1)(xi) and 613(b)(7).

¹⁰ See original Exemptive Request Letter, available at <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p602383.pdf>.

¹¹ See Participants’ Proposed RFP Concepts Document (last updated Jan. 16, 2013) (the “Proposed RFP Concepts Document”). The Proposed RFP Concepts Document was posted on the Consolidated Audit Trail NMS Plan website, <http://catnmsplan.com> (the “CAT NMS Plan Website”).

type and date account opened under Rule 613(c)(7)(viii)(B)).¹² The Participants believe that the requested relief is critical to the development of a cost-effective approach to the CAT.

The Participants also will seek to comply with their obligations related to the CAT under Reg SCI as efficiently as possible. When it adopted Reg SCI, the Commission expressed its belief that the CAT “will be an SCI system of each SCI SRO that is a member of an approved NMS plan under Rule 613, because it will be a facility of each SCI SRO that is a member of such plan.”¹³ The Participants intend to work together and with the Plan Processor, in consultation with the Commission, to determine a way to effectively and efficiently meet the requirements of Reg SCI without unnecessarily duplicating efforts.

A. Features and Details of the CAT NMS Plan.

1. Reporting Data to the CAT

As required by SEC Rule 613(a)(1)(i), this section describes the reporting of data to the Central Repository, including the sources of such data and the manner in which the Central Repository will receive, extract, transform, load, and retain such data. As a general matter, the data reported to the Central Repository is of two distinct types: (1) reference data (e.g., data concerning CAT Reporters and customer information, issue symbology information, and data from the SIPs); and (2) order and trade data submitted by CAT Reporters, including national securities exchanges, national securities associations and broker-dealers. Each of these types of data is discussed separately below.

(a) Sources of Data

In general, data will be reported to the Central Repository by national securities exchanges, national securities associations, broker-dealers, the SIPs for the CQS, CTA, UTP and Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information (“OPRA”) Plans, and certain other vendors or appropriate third parties (“Data Submitters”).¹⁴ Specifically, in accordance with SEC Rule 613(c)(5) and Sections 6.3 and 6.4 of the CAT NMS Plan, each national securities exchange and its members must report to the

¹² See Letter from the Participants to Brent J. Fields, Secretary, SEC re: Supplement to Request for Exemptive Relief from Certain Provisions of SEC Rule 613 of Regulation NMS under the Securities Exchange Act of 1934 (Sept. 2, 2015), available at the CAT NMS Plan Website. Separately, on April 3, 2015, the Participants filed with the Commission examples demonstrating how the proposed request for exemptive relief related to allocations would operate; this filing did not substantively update or amend the Exemptive Request Letter. See Letter from the Participants to Brent J. Fields, Secretary, SEC re: Supplement to Request for Exemptive Relief from Certain Provisions of SEC Rule 613 of Regulation NMS under the Securities Exchange Act of 1934 (Apr. 3, 2015), available at the CAT NMS Plan Website.

¹³ See Securities Exchange Act Release No. 73639 (Nov. 19, 2014), 79 Fed. Reg. 72252, 72275 n. 246 (Dec. 5, 2014) (adopting Reg SCI and citing the Adopting Release at 45774).

¹⁴ See Adopting Release at 45748 n.278 (noting that “the Rule does not preclude the NMS plan from allowing broker-dealers to use a third party to report the data required to the central repository on their behalf”). The Participants note that CAT Reporters using third party service providers to submit information on their behalf would still be responsible for all the data submitted on their behalf. The term “CAT Reporters” is generally used to refer to those parties that are required by SEC Rule 613 and the CAT NMS Plan to submit data to the CAT (i.e., national securities exchanges, national securities associations, and members thereof). The term “Data Submitters” includes those third-parties that may submit data to the CAT on behalf of CAT Reporters as well as outside parties that are not required to submit data to the CAT but from which the CAT may receive data (e.g., SIPs). Thus, all CAT Reporters are Data Submitters, but not all Data Submitters are CAT Reporters.

Central Repository the information required by SEC Rule 613(c)(7) for each NMS Security registered or listed for trading on such exchange or admitted to unlisted trading privileged on such exchange (subject to relief pursuant to the Exemptive Request Letters).¹⁵ Similarly, in accordance with SEC Rule 613(c)(6), each national securities association and its members must report to the Central Repository the information required by SEC Rule 613(c)(7) for each NMS Security for which transaction reports are required to be submitted to the association (subject to relief pursuant to the Exemptive Request Letters). Additionally, the Participants, in consultation with the DAG and with industry support, have determined to include OTC Equity Securities in the initial phase-in of the CAT; thus, CAT Reporters must also include order and trade information regarding orders for OTC Equity Securities in addition to those involving NMS Securities.¹⁶

In addition to order and execution data, SEC Rule 613 requires Industry Members to report customer information, including Customer-IDs, to the CAT so that order and execution data can be associated with particular Customers. However, in the Exemptive Request Letters, the Participants request relief that would permit CAT Reporters to provide information to the Central Repository using Firm Designated IDs instead of Customer-IDs. In addition, Industry Members are permitted to use Data Submitters that are not national securities exchanges, national securities associations, or members thereof to report the required data to the Central Repository on their behalf. The approach proposed in the Exemptive Request Letters also would permit Data Submitters to provide information to the Central Repository using Firm Designated ID for purposes of reporting information to the CAT.

The Central Repository also is required to collect National Best Bid and National Best Offer information, transaction reports reported to an effective transaction reporting plan filed with the SEC pursuant to SEC Rule 601, and Last Sale Reports reported pursuant to the OPRA Plan.¹⁷ Consequently, the Plan Processor must receive information from the SIPs for those plans and incorporate that information into the CAT. Lastly, as set forth in Appendix D, the Plan Processor must maintain a complete symbology database, including historical symbology. CAT Reporters will submit data to the CAT with the listing exchange symbology format, and the CAT must use the listing exchange symbology format in the display of linked data. The Participants will be responsible for providing the Plan Processor with issue symbol information, and issue symbol validation must be included in the processing of data submitted by CAT Reporters.

After reviewing the Bids and receiving industry input, the Participants do not believe there is a need to dictate that the Plan Processor adopt a particular format for the submission of data to the Central Repository. Rather, regardless of the format(s) adopted, the CAT must be

¹⁵ As noted, the Participants submitted the Exemptive Request Letters to facilitate compliance with the goals and purposes of the rule while minimizing the impact on existing market practices and reducing burdens on both Participants and broker-dealers.

¹⁶ See SIFMA Industry Recommendations for the Creation of the Consolidated Audit Trail (CAT) at 70 (Mar. 28, 2013) ("SIFMA Recommendations"), available at <http://www.sifma.org/workarea/downloadasset.aspx?id=8589942773>. Section 1.1 of the CAT NMS Plan includes OTC Equity Securities as "Eligible Securities." As discussed in Appendix C, Plan to Eliminate Existing Rules and Systems (SEC Rule 613(a)(1)(ix)), inclusion of OTC Equity Securities in the initial phase of the CAT should facilitate the retirement of FINRA's Order Audit Trail System ("OATS") and reduce costs to the industry.

¹⁷ SEC Rule 613(e)(7).

able to monitor incoming and outgoing data feeds and be capable of performing the following functions:

- Support daily files from each CAT Reporter;
- Support files that cover multiple days (for re-transmission);
- Support error correction files;
- Capture operational logs of transmissions, success, failure reasons, etc.; and
- Support real-time and batch feeds.

The Plan Processor will be required to ensure that each CAT Reporter is able to access its submissions for error correction purposes and transmit their data to the Central Repository on a daily basis. The Plan Processor must have a robust file management tool that is commercially available, including key management. In addition, at a minimum, the Plan Processor must be able to accept data from CAT Reporters and other Data Submitters via automated means (e.g., Secure File Transfer Protocol (“SFTP”)) as well as manual entry means (e.g., GUI interface).

The Plan Processor will be required to ensure that all file processing stages are handled correctly. This will include the start and stop of data reception, the recovery of data that is transmitted, the retransmission of data from CAT Reporters, and the resynchronization of data after any data loss. At a minimum, this will require the Plan Processor to have logic that identifies duplication of files. If transmission is interrupted, the Plan Processor must specify:

- data recovery process for partial submissions;
- operational logs/reporting;
- operational controls for receipt of data; and
- managing/handling failures.

The Plan Processor is required to establish a method for developing an audit trail of data submitted to and received by the Central Repository. This must include a validation of files to identify file corruption and incomplete transmissions. As discussed more fully below, an acknowledgement of data receipt and information on rejected data must be transmitted to CAT Reporters.

- (i) Data Submission for Orders and Reportable Events, including Manual Submission

Sections 6.3 and 6.4 of the CAT NMS Plan require CAT Reporters to provide details for each order and each Reportable Event to the Central Repository.¹⁸ In the RFP, the Participants requested that the Bidders describe the following:

- system interfaces, including data submission, data access and user interfaces;¹⁹
- the proposed messaging and communication protocol(s) used in data submission and retrieval and the advantage(s) of such protocol(s);²⁰
- the process and associated protocols for accepting batch submissions;²¹ and
- the process and any associated protocols for supporting manual data submissions.²²

(ii) The Timing of Reporting Data

Pursuant to SEC Rule 613(c)(3), Sections 6.3 and 6.4 of the CAT NMS Plan require that CAT Reporters report certain order and transaction information recorded pursuant to SEC Rule 613 or the CAT NMS Plan to the Central Repository by 8:00 a.m. Eastern Time on the Trading Day following the day such information is recorded.²³ SEC Rule 613(c)(3) notes, however, that the CAT NMS Plan “may accommodate voluntary reporting prior to 8:00 a.m. Eastern Time, but shall not impose an earlier deadline on the reporting parties.” Sections 6.3 and 6.4 of the CAT NMS Plan explicitly permit, but do not require, CAT Reporters to submit information to the CAT throughout the day. Because of the amount of data that will ultimately be reported to the CAT, the Participants have decided to permit Data Submitters to report data to the CAT as end of day files (submitted by 8:00 a.m. Eastern Time the following Trading Day) or throughout the day. The Participants believe that permitting Data Submitters to report data throughout the day may reduce the total amount of bandwidth used by the Plan Processor to receive data files and will allow CAT Reporters and other Data Submitters to determine which method is most efficient and cost-effective for them. However, the Plan Processor will still be required to have the capacity to handle two times the historical peak daily volume to ensure that, if CAT Reporters choose to submit data on an end-of-day basis, the Plan Processor can handle the influx of data.²⁴

(iii) Customer and Customer Account Information

In addition to the submission of order and trade data, broker-dealer CAT Reporters must also submit customer information to the CAT so that the order and trade data can be matched to

¹⁸ See SEC Rule 613(c)(7).

¹⁹ RFP Question 49.

²⁰ RFP Questions 59-60.

²¹ RFP Question 62.

²² RFP Question 63.

²³ SEC Rule 613 and Sections 6.3 and 6.4 of the CAT NMS Plan permit certain other information to be reported by 8:00 a.m. Eastern Time on the Trading Day following the day the CAT Reporter receives the information. See SEC Rule 613(c)(4), (c)(7)(vi)-(viii).

²⁴ SIFMA’s recommendations to the Participants regarding the CAT indicates support for the ability of Data Submitters to submit data in batch or near-real-time reporting. See SIFMA Recommendations, at 55.

the specific customer.²⁵ SEC Rule 613(c)(7) sets forth data recording and reporting requirements that must be included in the CAT NMS Plan. Under SEC Rule 613(c)(7)(i)(A), the CAT NMS Plan must require each CAT Reporter to record and report “Customer-ID(s) for each customer” when reporting to the CAT order receipt or origination information.²⁶ When reporting the modification or cancellation of an order, the rule further requires the reporting of “the Customer-ID of the Person giving the modification or cancellation instruction.”²⁷ In addition, SEC Rule 613(c)(8) mandates that all CAT Reporters “use the same Customer-ID . . . for each customer and broker-dealer.”²⁸ For purposes of SEC Rule 613, “Customer-ID” means, “with respect to a customer, a code that uniquely identifies such customer for purposes of providing data to the central repository.”²⁹ Also, SEC Rule 613(c)(7)(viii) requires that, for original receipt or origination of an order, CAT Reporters report “customer account information,” which is defined as including “account number, account type, customer type, date account opened, and large trader identifier (if applicable).”³⁰

After considering the requirements of SEC Rule 613 with respect to recording and reporting Customer-IDs, Customer Account Information, and information of sufficient detail to identify the Customer as well as industry input and the Commission’s reasons for adopting these requirements, the Participants requested that Industry Members and other industry participants provide ideas on implementing the Customer-ID requirement. After careful consideration, including numerous discussions with the DAG, the Participants concluded that the CAT NMS Plan should use a reporting model that requires broker-dealers to provide detailed account and Customer information to the Central Repository, including the specific identities of all Customers associated with each account, and have the Central Repository correlate the Customer information across broker-dealers, assign a unique customer identifier to each Customer (i.e., the Customer-ID), and use that unique customer identifier consistently across all CAT Data (hereinafter, the “Customer Information Approach”).

Under the Customer Information Approach, the CAT NMS Plan would require each broker-dealer to assign a unique Firm Designated ID to each customer, as that term is defined in SEC Rule 613. For the Firm Designated ID, broker-dealers would be permitted to use an account number or any other identifier defined by the firm, provided each identifier is unique across the firm for each business date (i.e., a single firm may not have multiple separate customers with the same identifier on any given date). Under the Customer Information Approach, broker-dealers must submit an initial set of customer information to the Central Repository, including, as applicable, the Firm Designated ID for the customer, name, address, date of birth, Individual Tax ID (“ITIN”)/social security number (“SSN”), individual’s role in the account (e.g., primary holder, joint holder, guardian, trustee, person with the power of attorney)

²⁵ As noted above, the term “customer” means “(i) [t]he account holder(s) of the account at a broker-dealer originating an order, and (ii) [a]ny person from whom the broker-dealer is authorized to accept trading instructions for such account, if different than the account holder(s).” SEC Rule 613(j)(3).

²⁶ SEC Rule 613(c)(7)(i)(A).

²⁷ SEC Rule 613(c)(7)(iv)(F).

²⁸ SEC Rule 613(c)(8).

²⁹ SEC Rule 613(j)(5).

³⁰ SEC Rule 613(j)(4).

and Legal Entity Identifier (“LEI”),³¹ and/or Large Trader ID (“LTID”), if applicable.³² Under the Customer Information Approach, broker-dealers would be required to submit to the Central Repository daily updates for reactivated accounts, newly established or revised Firm Designated IDs, or associated reportable Customer information.³³

Within the Central Repository, each Customer would be uniquely identified by identifiers or a combination of identifiers such as TIN/SSN, date of birth, and, as applicable, LEI and LTID. The Plan Processor would be required to use these unique identifiers to map orders to specific customers across all broker-dealers. Broker-dealers would therefore be required to report only Firm Designated ID information on each new order submitted to the Central Repository rather than the “Customer-ID” as set forth in SEC Rule 613(c)(7), and the Plan Processor would associate specific customers and their Customer-IDs with individual order events based on the reported Firm Designated ID.

The Customer-ID approach is strongly supported by the industry as it believes that to do otherwise would interfere with existing business practices and risk leaking proprietary order and customer information into the market.³⁴ To adopt such an approach, however, requires certain exemptions from the requirements of SEC Rule 613. Therefore, the Participants included the Customer Information Approach in the Exemptive Request Letters so that this approach could be included in the CAT NMS Plan.

In addition to the approach described above, the CAT NMS Plan details a number of requirements which the Plan Processor must meet regarding Customer and Customer Account Information.

The Plan Processor must maintain information of sufficient detail to uniquely and consistently identify each Customer across all CAT Reporters, and associated accounts from each CAT Reporter. The Plan Processor must document and publish, with the approval of the Operating Committee, the minimum list of attributes to be captured to maintain this association.

The CAT Processor must maintain valid Customer and Customer Account Information for each Trading Day and provide a method for Participants and the SEC to easily obtain historical changes to that information (e.g., name changes, address changes).

³¹ Where a validated LEI is available for a Customer or entity, it may obviate the need to report other identifier information (e.g., Customer name, address).

³² The Participants anticipate that Customer information that is initially reported to the CAT could be limited to only customer accounts that have, or are expected to have, CAT-reportable activity. For example, accounts that are considered open, but have not traded Eligible Securities in a given timeframe may not need to be pre-established in the CAT, but rather could be reported as part of daily updates after they have CAT-reportable activity.

³³ Because reporting to the CAT is on an end-of-day basis, intra-day changes to information could be captured as part of the daily updates to the information. *See* SEC Rule 613(c)(3). To ensure the completeness and accuracy of Customer information and associations, in addition to daily updates, broker-dealers would be required to submit periodic full refreshes of Customer information to the CAT. The scope of the “full” Customer information refresh would need to be further defined, with the assistance of the Plan Processor, to determine the extent to which inactive or otherwise terminated accounts would need to be reported.

³⁴ SIFMA Recommendations at 30-31; Financial Industry Forum (FIF) Consolidated Audit Trail (CAT) Working Group Response to Proposed RFP Concepts Document at 12 (Jan. 18, 2013), *available at* <http://catnmsplan.com/industryFeedback/P197808> (“FIF Response”).

The CAT Processor will design and implement a robust data validation process for submitted Firm Designated ID, Customer Account Information and Customer Identifying Information.

The Plan Processor must be able to link accounts that move from one CAT Reporter to another due to mergers and acquisitions, divestitures, and other events. Under the approach proposed by the Participants, broker-dealers will initially submit full account lists for all active accounts to the Plan Processor and subsequently submit updates and changes on a daily basis.³⁵ In addition, the Plan Processor must have a process to periodically receive full account lists to ensure the completeness and accuracy of the account database.

In the RFP, the Participants asked for a description of how Customer and Customer Account Information will be captured, updated and stored with associated detail sufficient to identify each Customer.³⁶ All Bidders anticipated Customer and Customer Account Information to be captured in an initial download of data. The precise method(s) by which CAT Reporters submit Customer data to the Central Repository will be set out in the Technical Specifications provided by the Plan Processor in accordance with Section 6.9 of the CAT NMS Plan. Data capture would occur using both file-based and entry screen methods. Data validation would check for potential duplicates with error messages being generated for follow-up by CAT Reporters. Data Reporters can update data as needed or on a predetermined schedule.

(iv) Error Reporting

SEC Rule 613(e)(6) requires the prompt correction of errors in data submitted to the Central Repository. As discussed in Appendix C, Time and Method by which CAT Data will be Available to Regulators, initial validation, lifecycle linkages, and communications of errors to CAT Reporters will be required to occur by 12:00 p.m. Eastern Time T+1 and corrected data will be required to be resubmitted to the Central Repository by 8:00 a.m. Eastern Time on T+3. Each of the Bidders indicated that it was able to meet these timeframes.

However, the industry expressed concern that reducing the error repair window will constitute a significant burden to Data Submitters and also question whether the proposed error correction timeframe is possible.³⁷ Financial Information Forum (“FIF”) supports maintaining the current OATS Error Handling timelines, which allows for error correction within five OATS business days from the date of original submission.³⁸ Securities Industry and Financial Markets Association (“SIFMA”) also recommends a five-day window for error correction.³⁹ Nevertheless, the Participants believe that it is imperative to the utility of the Central Repository that corrected data be available to regulators as soon as possible and recommend the three-day window for corrections to balance the need for regulators to access corrected data in a timely manner while considering the industry’s concerns.

³⁵ “Active accounts” are defined as accounts that have had activity within the last six months.

³⁶ RFP Question 1.

³⁷ FIF Response at 35.

³⁸ *Id.*

³⁹ SIFMA Recommendations at 62.

(b) The Manner in which the Central Repository will Receive, Extract, Transform, Load, and Retain Data

The Central Repository must receive, extract, transform, load, and retain the data submitted by CAT Reporters and other Data Submitters. In addition, the Plan Processor is responsible for ensuring that the CAT contains all versions of data submitted by a CAT Reporter or other Data Submitter (i.e., the Central Repository must include different versions of the same information, including such things as errors and corrected data).⁴⁰

In the RFP, the Participants requested that each Bidder perform a detailed analysis of current industry systems and interface specifications to propose and develop their own format for collecting data from the various data sources relevant under SEC Rule 613, as outlined in the RFP. Bidders also were requested to perform an analysis on their ability to develop, test and integrate this interface with the CAT.⁴¹ In addition, the Participants sought input from the industry regarding different data submission mechanisms and whether there needs to be a method to allow broker-dealers with very small order volumes to submit their data in a non-automated manner.⁴²

As noted above, since the Central Repository is required to collect and transform customer, order and trade information from multiple sources, the RFP requested that Bidders describe:

- how Customer and Customer Account Information will be captured, updated and stored with associated detail sufficient to identify each customer;⁴³
- the system interfaces, including data submission, data access and user interfaces;⁴⁴
- the proposed messaging and communication protocol(s) used in data submission and retrieval and the advantage(s) of such protocol(s);⁴⁵
- the process and associated protocols for accepting batch submissions;⁴⁶ and
- the process and any associated protocols for supporting manual data submissions.⁴⁷

⁴⁰ Data retention requirements by the Central Repository are discussed more fully in Appendix D, Functionality of the CAT System.

⁴¹ RFP § 2.3 at 19.

⁴² SEC Rule 613: Consolidated Audit Trail (CAT), Questions for Industry Consideration, *available at* <http://catnmsplan.com/QuestionsforIndustryConsideration>.

⁴³ RFP Question 1.

⁴⁴ RFP Question 49.

⁴⁵ RFP Questions 59-60.

⁴⁶ RFP Question 62.

⁴⁷ RFP Question 63.

Various Bidders proposed multiple methods by which Data Reporters could report information to the Central Repository. Bidders proposed secure VPN, direct line access through TCP/IP or at co-location centers, and web-based manual data entry.

The RFP also requested that Bidders describe:

- the overall technical architecture;⁴⁸ and
- the network architecture and describe how the solution will handle the necessary throughput, processing timeline and resubmissions.⁴⁹

There are two general approaches by which the Central Repository could receive information. Approach 1 described a scenario in which broker-dealers would submit relevant data to the Central Repository using their choice of existing industry messaging protocols, such as the Financial Information eXchange (“FIX”) protocol. Approach 2 provided a scenario in which broker-dealers would submit relevant data to the Central Repository using a defined or specified format, such as an augmented version of OATS.

Following receipt of data files, the Plan Processor will be required to send an acknowledgement of data received to CAT Reporters and third party Data Submitters. This acknowledgement will enable CAT Reporters to create an audit trail of their data submissions and allow for tracing of data breakdowns if data is not received. The minimum requirements for receipt acknowledgement are detailed in Appendix D, Receipt of Data from Reporters.

Once the Central Repository has received the data from the CAT Reporters, it will extract individual records from the data, and validate the data through a review process that must be described in the Technical Specifications involving context, syntax, and matching validations. The Plan Processor will need to validate data and report back to any CAT Reporter any data that has not passed validation checks according to the requirements in Appendix D, Receipt of Data from Reporters. To ensure the accuracy and integrity of the data in the Central Repository, data that does not pass the basic validation checks performed by the Plan Processor must be rejected until it has been corrected by the CAT Reporter responsible for submitting the data/file. After the Plan Processor has processed the data, it must provide daily statistics regarding the number of records accepted and rejected to each CAT Reporter.

The Plan Processor also will be required to capture rejected records for each CAT Reporter and make them available to the CAT Reporter. The “rejects” file must be accessible via an electronic file format, and the rejections and daily statistics must also be available via a web interface. The Plan Processor must provide functionality for CAT Reporters to amend records that contain exceptions. The Plan Processor must also support bulk error correction so that rejected records can be resubmitted as a new file with appropriate indicators for rejection repairs. The Plan Processor must, in these instances, reprocess repaired records. In addition, a web GUI must be available for CAT Reporters to make updates, including corrections, to

⁴⁸ RFP Question 43.

⁴⁹ RFP Question 50.

individual records or attributes. The Plan Processor must maintain a detailed audit trail capturing corrections to and replacements of records.

The Plan Processor must provide CAT Reporters with documentation that details how to amend/upload records that fail the required validations, and if a record does not pass basic validations, such as syntax rejections, then it must be rejected and sent back to the CAT Reporter as soon as possible, so it can be repaired and resubmitted.⁵⁰ In order for regulators to have access to accurate and complete data as expeditiously as practicable, the Plan Processor will provide CAT Reporters with their error reports as they become available, and daily statistics must be provided after data has been uploaded and validated. The reports will include descriptive details as to why each data record was rejected by the Plan Processor.

In addition, on a monthly basis, the Plan Processor should produce and publish reports detailing CAT Reporter performance and comparison statistics, similar to the report cards published for OATS presently. These reports should include data to enable CAT Reporters to assess their performance in comparison to the rest of their industry peers and to help them assess the risk related to their reporting of transmitted data.

CAT Reporters will report data to the Central Repository either in a uniform electronic format, or in a manner that would allow the Central Repository to convert the data to a uniform electronic format, for consolidation and storage. The Technical Specifications will describe the required format for data reported to the Central Repository. Results of a study conducted of broker-dealers showed average implementation and maintenance costs for use of a new file format to be lower than those for use of an existing file format (e.g., FIX)⁵¹, although an FIF “Response to Proposed RFP Concepts Document” dated January 18, 2013 did indicate a preference among its members for use of the FIX protocol.

As noted above, the specific formats of data submission and loading will depend upon the Bidder chosen as the Plan Processor. Regardless of the ultimate Plan Processor, however, data submitted to the CAT will be loaded into the Central Repository in accordance with procedures that are subject to approval by the Operating Committee.⁵² The Central Repository will retain data, including the Raw Data, linked data, and corrected data, for at least six years. Data submitted to the Central Repository, including rejections and corrections, must be stored in repositories designed to hold information based on the classification of the Data Submitter (e.g., whether the Data Submitter is a Participant, a broker-dealer, or a third party Data Submitter). After ingestion by the Central Repository, the Raw Data must be transformed into a format appropriate for data querying and regulatory output.

SEC Rule 613 reflects the fact that the Participants can choose from alternative methods to link order information to create an order lifecycle from origination or receipt to cancellation or execution.⁵³ After review of the Bids and discussions with Industry Members, the CAT NMS Plan reflects the fact that the Participants have determined that the “daisy chain” approach to

⁵⁰ The industry supports receiving information on reporting errors as soon as possible to enable CAT Reporters to address errors in a timely manner. *See* FIF Response at 36.

⁵¹ *See* Appendix C, Analysis of Expected Benefits and Estimated Costs for Creating, Implementing, and Maintaining the Consolidated Audit Trail (SEC Rule 613(a)(1)(vii)), for additional details on cost studies.

⁵² *See* Section 6.1(c) of the CAT NMS Plan.

⁵³ *See* SEC Rule 613(j)(1).

CAT-Order-ID that requires linking of order events rather than the repeated transmission of an order ID throughout an order's lifecycle is appropriate. This approach is widely supported by the industry, and using the daisy chain approach should minimize impact on existing OATS reporters, since OATS already uses this type of linking.⁵⁴ The RFP asked Bidders to propose any additional alternatives to order lifecycle creation; however, all of the Bidders indicated that they would use the daisy chain approach to link order events.⁵⁵

In the daisy chain approach, a series of unique order identifiers assigned by CAT Reporters to individual order events are linked together by the CAT and assigned a single CAT-generated CAT-Order-ID that is associated with each individual order event and used to create the complete lifecycle of an order. Under this approach, each CAT Reporter generates its own unique order ID but can pass a different identifier as the order is routed to another CAT Reporter, and the CAT will link related order events from all CAT Reporters involved in the life of the order.⁵⁶

The Participants believe that the daisy chain approach can handle anticipated order handling scenarios, including aggregation and disaggregation, and generally apply to both equities and options. The Participants created a subcommittee of DAG members and Participants to walk through multiple complex order-handling scenarios to ensure that the daisy chain approach can handle even the most complex of order handling methods.⁵⁷

Additionally, the daisy chain approach can handle representative order reporting scenarios⁵⁸ and order handling scenarios sometimes referred to as "complex orders" that are specific to options and may include an equity component and multiple option components (e.g., buy-write, straddle, strangle, ratio spread, butterfly and qualified contingent transactions). Typically, these orders are referenced by exchange systems on a net credit/debit basis, which can cover between two and twelve different components. Such "complex orders" must also be handled and referenced within the CAT. The Bidder must develop, in close consultation with Industry Members, a linking mechanism that will allow the CAT to link the option leg(s) to the related equity leg or the individual options components to each other in a multi-leg strategy scenario.

Once a lifecycle is assembled by the CAT, individual lifecycle events must be stored so that each unique event (e.g., origination, route, execution, modification) can be quickly and easily associated with the originating customer(s) for both targeted queries and comprehensive data scans. For example, an execution on an exchange must be linked to the originating

⁵⁴ See SIFMA Recommendations at 13, 39-42; FIF Response at 19.

⁵⁵ See RFP Questions 11 and 12.

⁵⁶ A detailed example of the application of the daisy chain approach to an order routed to an exchange on an agency basis can be found in the Proposed RFP Concepts Document at 26.

⁵⁷ This subcommittee included 21 Industry Members and 16 Participants. It met 11 times over the course of 13 months to discuss order handling and CAT reporting requirements. Examples of order handling scenarios that must be addressed include, in addition to the agency scenario referenced above: orders handled on a riskless principal basis, orders routed out of a national securities exchange through a broker-dealer router to another national securities exchange, orders executed on an average price basis and orders aggregated for further routing and execution. Detailed examples of these types of scenarios can be found in the Proposed RFP Concepts Document at 27-30.

⁵⁸ These scenarios, and how the daisy chain approach could be applied, can be found in the Representative Order Proposal (Feb. 2013), available at http://catnmsplan.com/web/idcplg?IdcService=SS_GET_PAGE&ssDocName=P197815.

customer(s) regardless of how the order may have been aggregated, disaggregated, and routed through multiple broker-dealers before being sent to the exchange for execution.

The Plan Processor must transform and load the data in a way that provides the Participants with the ability to build and generate targeted queries against data in the Central Repository across product classes submitted to the Central Repository. The Participants' regulatory staff and the SEC must be able to create, adjust, and save ad-hoc queries to provide data to the regulators that can then be used for their market surveillance purposes. All data fields may be included in the result set from targeted queries. Because of the size of the Central Repository and its use by multiple parties simultaneously, online queries will require a minimum set of criteria, including data or time range as well as one or more of the parameters specified in Appendix D, Functionality of the CAT System.⁵⁹

Because of the potential size of the possible result sets, the Plan Processor must have functionality to create an intermediate result count of records before running the full query so that the query can be refined if warranted. The Plan Processor must include a notification process that informs users when reports are available, and there should be multiple methods by which query results can be obtained (e.g., web download, batch feed). Regulatory staff also must have the ability to create interim tables for access / further investigation. In addition, the Plan Processor must provide a way to limit the number of rows from a result set on screen with full results being created as a file to be delivered via a file transfer protocol.

The Plan Processor will be reasonably required to work with the regulatory staff at the Participants and other regulators⁶⁰ to design report generation screens that will allow them to request on-demand pre-determined report queries. These would be standard queries that would enable regulators quick access to frequently-used information and could include standard queries that will be used to advance the retirement of existing reports, such as Large Trader reporting.

The Central Repository must, at a minimum, be able to support approximately 3,000 active users, including Participants' regulatory staff and the SEC, authorized to access data representing market activity (excluding the PII associated with customers and accounts).⁶¹

2. Time and Method by which CAT Data will be Available to Regulators (SEC Rule 613(a)(1)(ii))

SEC Rule 613(a)(1)(ii) requires the Participants to discuss the “time and method by which the data in the Central Repository will be made available to regulators to perform surveillance or analyses, or for other purposes as part of their regulatory and oversight responsibilities.”⁶² As the Commission noted, “[t]he time and method by which data will be available to regulators are fundamental to the utility of the Central Repository because the

⁵⁹ Although the Plan Processor must account for multiple simultaneous queries, the Central Repository must also support the ability to schedule when jobs are run.

⁶⁰ Initially, only the SEC and Participants will have access to data stored in the Central Repository.

⁶¹ The RFP required support for a minimum of 3,000 users. The actual number of users may be higher based upon regulator and Participant usage of the system.

⁶² SEC Rule 613(a)(1)(ii).

purpose of the repository is to assist regulators in fulfilling their responsibilities to oversee the securities markets and market participants.”⁶³

(a) Time Data will be Made Available to Regulators

At any point after data is received by the Central Repository and passes basic format validations, it will be available to the Participants and the SEC. The Plan Processor must ensure that regulators have access to corrected and linked order and Customer data by 8:00 a.m. Eastern Time on T+5.

As noted above, SEC Rule 613(e)(6) requires the prompt correction of data reported to the Central Repository, and the Participants believe that the timeframes established in Appendix D, Data Availability, meet this requirement. Additionally, each of the Bidders indicated that it would be able to process the reported data within these timeframes. However, the FIF, an industry trade group, expressed concern that the error repair window will constitute a significant burden to CAT Reporters and questioned whether the error repair window “can be reasonably met.”⁶⁴ FIF supports maintaining the current OATS Error Handling timelines, which allow for error correction within five OATS-business days from the date of original submission.⁶⁵ SIFMA also recommends a five-day window for error correction.⁶⁶ Nevertheless, the Participants believe that it is imperative to the utility of the Central Repository that corrected data be available to regulators as soon as possible, and therefore the Participants do not support adopting the five-day repair window permitted under OATS, but instead are providing a three-day repair window for the Central Repository.⁶⁷

(b) Method by which Data will be Available to Regulators

As required by SEC Rule 613(a)(1)(ii), this section describes the ability of regulators to use data stored in the Central Repository for investigations, examinations and surveillance, including the ability to search and extract such data.⁶⁸ The utility of the Central Repository is dependent on regulators being able to have access to data for use in market reconstruction, market analysis, surveillance and investigations.⁶⁹ The Participants anticipate that the Plan Processor will adopt policies and procedures with respect to the handling of surveillance (including coordinated, SEC Rule 17d-2 or RSA surveillance) queries and requests for data. In the RFP, the Participants asked that the Bidders describe:

- the tools and reports that would allow for the extraction of data search criteria;⁷⁰

⁶³ Adopting Release at 45790.

⁶⁴ FIF Response at 35.

⁶⁵ FIF Response at 35.

⁶⁶ SIFMA Recommendations at 62.

⁶⁷ One example of why the Participants believe a five day repair window is too long is that regulators may need access to the data as quickly as possible in order to conduct market reconstruction.

⁶⁸ SEC Rule 613(a)(1)(ii).

⁶⁹ Adopting Release at 45790.

⁷⁰ RFP Question 81.

- how the system will accommodate simultaneous users from Participants and the SEC submitting queries;⁷¹
- the expected response time for query results, the manner in which simultaneous queries will be managed and the maximum number of concurrent queries and users that can be supported by the system;⁷²
- the format in which the results of targeted queries will be provided to users;⁷³
- the methods of data delivery that would be made available to Participant regulatory staff and the Commission;⁷⁴
- any limitations on the size of data that can be delivered at one time, such as number of days or number of terabytes;⁷⁵ and
- how simultaneous bulk data requests will be managed to ensure fair and equitable access.⁷⁶

All Bidders provide means for off-line analysis⁷⁷ and dynamic search and extraction. The Bids described a variety of tools that could be used for providing access and reports to the Participants and the SEC, including: Oracle Business Intelligence Experience Edition, SAS Enterprises Business Intelligence, and IBM Cognos. The Bids proposed data access via direct access portals and via web-based applications. In addition, the Bids proposed various options for addressing concurrent users and ensuring fair access to the data, including: processing queries on a first in, first out (FIFO) basis; monitoring to determine if any particular user is using more systems resources than others and prioritizing other users' queries; or evaluating each users' demands on the systems over a predetermined timeframe and, if there is an imbalance, working with users to provide more resources needed to operate the system more efficiently.

The Bids included a multitude of options for formatting the data provided to regulators in response to their queries, including but not limited to FIX, Excel, Binary, SAS data sets, PDF, XML, XBRL, CSV, and .TXT. Some Bidders would provide Participants and the SEC with a "sandbox" in which the user could store data and upload its own analytical tools and software to analyze the data within the Central Repository, in lieu of performing off-line analyses.

The Participants anticipate that they will be able to utilize Central Repository data to enhance their existing regulatory schemes. The Participants do not endorse any particular technology or approach, but rather set forth standards which the Plan Processor must meet. By doing so, the Participants are seeking to maximize the utility of the data from the Central Repository without burdening the Plan Processor to comply with specific format or application

⁷¹ RFP Question 82.

⁷² RFP Question 83.

⁷³ RFP Question 84.

⁷⁴ RFP Question 85.

⁷⁵ RFP Question 86.

⁷⁶ RFP Question 87.

⁷⁷ The SEC defined "off-line" analysis as "any analysis performed by a regulator based on data that is extracted from the [CAT] database, but that uses the regulator's own analytical tools, software, and hardware." Adopting Release at 45798 n.853.

requirements which will need to be updated over time. In addition, the Participants wanted to ensure that the Bidders have the ability to put forth the ideas they believe are the most effective.

(c) Report Building - Analysis Related to Usage of Data by Regulators

It is anticipated that the Central Repository will provide regulators with the ability to, for example, more efficiently conduct investigations, examinations, conduct market analyses, and to inform policy-making decisions. The Participants' regulatory staff and the SEC will frequently need to be able to perform queries on large amounts of data. The Plan Processor must provide the Participants and other regulators the access to build and generate targeted queries against data in the Central Repository. The Plan Processor must provide the regulatory staff at the Participants and regulators with the ability to create, adjust, and save any ad-hoc queries they run for their surveillance purposes via online or direct access to the Central Repository.⁷⁸ Queries will require a minimum set of criteria that are detailed in Appendix D.⁷⁹ The Plan Processor will have controls to manage load, cancel queries, if needed, and create a request process for complex queries to be run.⁸⁰ The Plan Processor must have a notification process to inform users when reports are available, provide such reports in multiple formats, and have the ability to schedule when queries are run.⁸¹

In addition, the Plan Processor will be required to reasonably work with the regulatory staff at the Participants and other regulators to design report generation screens that will allow them to request on-demand pre-determined report queries.⁸² These would be standard queries that would enable regulators quick access to frequently-used information. This could include standard queries that will be used to advance the retirement of existing reports, such as Large Trader.⁸³

The Plan Processor should meet the following response times for different query types. For targeted search criteria, the minimum acceptable response times would be measured in time increments of less than one minute. For the complex queries that either scan large volumes of data (e.g., multiple trade dates) or return large result sets (>1M records), the response time should generally be available within 24 hours of the submission of the request.

The Central Repository will support a permission mechanism to assign data access rights to all users so that CAT Reporters will only have access to their own reported data, the regulatory staff at the Participants and other regulators will have access to data; except for PII.⁸⁴ Regulators that are authorized to access PII will be required to complete additional authentications. The Central Repository will be able to provide access to the data at the working locations of both the Participants' and SEC's regulatory staff as well as other non-office locations. The Central Repository must be built with operational controls to control access to

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

⁸⁴ As documented in Appendix D, each CAT Reporter will be issued a public key pair ("PKI") that it can use to submit data, and access confirmation that their data has been received.

make requests and to track data requests to support an event-based and time-based scheduler for queries that allows Participants to rely on the data generated.

In addition to targeted analysis of data from the Central Repository, regulators will also need access to bulk data for analysis. The Participants and other regulators will need the ability to do bulk extraction and download of data, based on a specified date or time range, market, security, and Customer-ID. The size of the resulting data set may require the ability to feed data from the Central Repository into analytical “alert” programs designed to detect potentially illegal activity.⁸⁵ “For example, the Commission is likely to use data from the Central Repository to calculate detailed statistics on order flow, order sizes, market depth and rates of cancellation, to monitor trends and inform Participant and SEC rulemaking.”⁸⁶

The Plan Processor must provide for bulk extraction and download of data in industry standard formats. In addition, the Plan Processor is required to generate data sets based on market event data to the Participants and other regulators. The Central Repository must provide the ability to define the logic, frequency, format, and distribution method of the data. It must be built with operational controls to track data requests to oversee the bulk usage environment and support an event-based and time-based scheduler for queries that allows Participants to rely on the data generated. Extracted data should be encrypted, and PII data should be masked unless users have permission to view the data that has been requested.

The Plan Processor must have the capability and capacity to provide bulk data necessary for the Participants and the other regulators to run and operate their surveillance processing. Such data requests can be very large; therefore, the Plan Processor must have the ability to split large requests into smaller data sets for data processing and handling. All reports should be generated by a configurable workload manager that is cost based, while also ensuring that no single user is using a disproportionate amount of resources for query generation.

(d) System Service Level Agreements (SLAs)

As further described in Appendix D, Functionality of CAT Systems, the Participants and the Plan Processor will enter into appropriate SLAs in order to establish system and operational performance requirements for the Plan Processor and help ensure timely Regulator access to Central Repository data. Among the items to be included in the SLA(s) will be specific requirements regarding query performance, linkage and order event processing performance of the Central Repository (e.g., linkage and data availability timelines, linkage errors not related to invalid data, and data retention) as well as system availability requirements (e.g., system uptime and DR/BCP performance). The Operating Committee will periodically review the SLAs according to the terms to be established in negotiation with the Plan Processor.

3. The Reliability and Accuracy of the Data (SEC Rule 613(a)(1)(iii))

As required by SEC Rule 613(a)(1)(iii), this section discusses the reliability and accuracy of the data reported to and maintained by the Central Repository throughout its lifecycle, including: transmission and receipt from CAT Reporters; data extraction, transformation and

⁸⁵ Adopting Release at 45799. *See also* RFP § 2.8.2.

⁸⁶ Adopting Release at 45799.

loading at the Central Repository; data maintenance at the Central Repository; and data access by the Participants and other regulators. In the Adopting Release, the Commission noted that the usefulness of the data to regulators would be significantly impaired if it is unreliable or inaccurate and as such, the Commission requested that the Participants discuss in detail how the Central Repository will be designed, tested and monitored to ensure the reliability and accuracy of the data collected and maintained in it.⁸⁷

(a) Transmission, Receipt, and Transformation

The initial step in ensuring the reliability and accuracy of data in the Central Repository is the validation checks made by the Plan Processor when data is received and before it is accepted into the Central Repository. In the RFP, the Participants stated that validations must include checks to ensure that data is submitted in the required formats and that lifecycle events can be accurately linked by 12:00 p.m. Eastern Time on T+1, four hours following the submission deadline for CAT Reporters.⁸⁸ Once errors are identified, they must be efficiently and effectively communicated to CAT Reporters on a daily basis. CAT Reporters will be required to correct and resubmit identified errors within established timeframes (as discussed in Appendix D, Data Availability).

The Plan Processor must develop specific data validations in conjunction with development of the Central Repository which must be published in the Technical Specifications. The objective of the data validation process is to ensure that data is accurate, timely and complete at or near the time of submission, rather than to identify submission errors at a later time after data has been processed and made available to regulators. To achieve this objective, a comprehensive set of data validations must be developed that addresses both data quality and completeness. For any data that fails to pass these validations, the Plan Processor will be required to handle data correction and resubmission within established timeframes both in a batch process format and via manual web-based entry.

To assess different validation mechanisms and integrity checks, the RFP required Bidders to provide information on the following:

- how data format and context validations for order and quote events submitted by CAT Reporters will be performed and how rejections or errors will be communicated to CAT Reporters;⁸⁹
- a system flow diagram reflecting the overall data format, syntax and context validation process that includes when each types of validation will be completed and errors communicated to CAT Reporters, highlighting any dependencies between the different validations and impacts of such dependencies on providing errors back to CAT Reporters;⁹⁰

⁸⁷ Adopting Release at 45790-91, 45799.

⁸⁸ RFP Section 2.2.4.

⁸⁹ RFP Question 14.

⁹⁰ RFP Question 15.

- how related order lifecycle events submitted by separate CAT Reporters will be linked and how unlinked events will be identified and communicated to CAT Reporters for correction and resubmission, including a description of how unlinked records will be provided to CAT Reporters for correction (e.g., specific transmission methods and/or web-based downloads);⁹¹
- how Customer and Customer Account Information submitted by broker-dealers will be validated and how rejections or errors will be communicated to CAT Reporters;⁹² and
- the mechanisms that will be provided to CAT Reporters for the correction of both market data (e.g., order, quotes, and trades) errors, and Customer and account data errors, including batch resubmissions and manual web-based submissions.⁹³

Most Bidders indicated that Customer Account Information including SSN, TIN or LEI will be validated in the initial onboarding processing. Additional validation of Customer Account Information, such as full name, street address, etc., would occur across CAT Reporters and potential duplications or other errors would be flagged for follow-up by the CAT Reporters.

All Bidders recommended that order data validation be performed via rules engines, which allow rules to be created and modified over time in order to meet future market data needs. Additionally, all Bidders indicated that data validations will be real-time and begin in the data ingestion component of the system. Standard data validation techniques include format checks, data type checks, consistency checks, limit and logic checks, or data validity checks. Some Bidders mentioned the ability to schedule the data validation at a time other than submission, because there may be a need to have rules engines perform validation in a batch mode or customized schedule during a different time. All Bidders indicated that when errors are found, the Raw Data will be stored in an error database and notifications would be sent to the CAT Reporters. Most Bidders permitted error correction to be submitted by CAT Reporters at any time.

Section 6.3(b) of the CAT NMS Plan sets forth the policies and procedures for ensuring the timeliness, accuracy and completeness of the data provided to the Central Repository as required by SEC Rule 613(e)(4)(ii) and the accuracy of the data consolidated by the Plan Processor pursuant to SEC Rule 613(e)(4)(iii).⁹⁴ It also mandates that each Participant and its Industry Members that are CAT Reporters must ensure that its data reported to the Central Repository is accurate, timely, and complete. Each Participant and its Industry Members that are CAT Reporters must correct and resubmit such errors within established timeframes. In furtherance thereof, data related to a particular order will be reported accurately and sequenced from receipt or origination, to routing, modification, cancellation and/or execution. Additionally each Participant and its Industry Members that are CAT Reporters must test their reporting

⁹¹ RFP Question 16.

⁹² RFP Question 17.

⁹³ RFP Question 18.

⁹⁴ SEC Rule 613(e)(4)(ii) and (iii).

systems thoroughly before beginning to report data to the Central Repository and Appendix D sets forth that the Plan Processor must make testing facilities available for such testing.

Pursuant to SEC Rule 613(e)(4)(iii), the Plan Processor will design, implement and maintain (1) data accuracy and reliability controls for data reported to the Central Repository and (2) procedures for testing data accuracy and reliability during any system release or upgrade affecting the Central Repository and the CAT Reporters.⁹⁵ The Operating Committee will, as needed, but at least annually, review policies and procedures to ensure the timeliness, accuracy, and completeness of data reported to the Central Repository.

In order to validate data receipt, the Plan Processor will be required to send an acknowledgement to each CAT Reporter notifying them of receipt of data submitted to the Central Repository to enable CAT Reporters to create an audit trail of their own submissions and allow for tracking of data breakdowns when data is not received. The data received by the Plan Processor must be validated at both the file and individual record level if appropriate. The required data validations may be amended based on input from the Operating Committee and the Advisory Committee. Records that do not pass basic validations, such as syntax rejections, will be rejected and sent back to the CAT Reporter as soon as possible, so it can repair and resubmit the data.

(b) Error Communication, Correction, and Processing

The Plan Processor will define and design a process to efficiently and effectively communicate to CAT Reporters identified errors. All identified errors will be reported back to the CAT Reporter and other Data Submitters who submitted the data to the Central Repository on behalf of the CAT Reporter, if necessary. The Central Repository must be able to receive error corrections and process them at any time, including timeframes after the standard repair window. The industry supports a continuous validation process for the Central Repository, continuous feedback to CAT Reporters on error identification and the ability to provide error correction at any time even if beyond the error correction timeframe.⁹⁶ The industry believes that this will better align with the reporting of complex transactions and allocations and is more efficient for CAT Reporters.⁹⁷ CAT Reporters will be able to submit error corrections through a web-interface or via bulk uploads or file submissions. The Plan Processor must support bulk replacement of records, subject to approval by the Operating Committee, and reprocess such replaced records. A GUI must be available for CAT Reporters to make updates to individual records or attributes. Additionally, the Plan Processor will provide a mechanism to provide auto-correction of identified errors and be able to support group repairs (i.e., the wrong issue symbol affecting multiple reports).

⁹⁵ SEC Rule 613(e)(4)(iii).

⁹⁶ FIF Consolidated Audit Trail Working Group Processor Proposed Optimal Solution Recommendations at 6 (Sep. 15, 2014), *available at* <http://www.sec.gov/comments/4-668/4668-16.pdf> (the “FIF Optimal Solution Recommendations”).

⁹⁷ FIF Response at 36.

SEC Rule 613(e)(6) also requires the Participants to specify a maximum Error Rate for data reported to the Central Repository pursuant to SEC Rule 613(c)(3) and (4).⁹⁸ The Participants understand that the Central Repository will require new reporting elements and methods for CAT Reporters and there will be a learning curve when CAT Reporters begin to submit data to the Central Repository.⁹⁹ However, the utility of the CAT is dependent on it providing a timely, accurate and complete audit trail for the Participants and other regulators.¹⁰⁰ Therefore, the Participants are proposing an initial maximum Error Rate of 5%, subject to quality assurance testing performed prior to launch, and it is anticipated that it will be reset when Industry Members, excluding Small Industry Members, begin to report to the Central Repository and again when Small Industry Members begin to report to the Central Repository. The Participants believe that this rate strikes the balance of making allowances for adapting to a new reporting regime, while ensuring that the data provided to regulators will be capable of being used to conduct surveillance and market reconstruction. Periodically, the Plan Processor will analyze reporting statistics and Error Rates and make recommendations to the Operating Committee for proposed changes to the maximum Error Rate. Changes to the maximum Error Rate will be approved by the Operating Committee. The maximum Error Rate will be reviewed and reset at least on an annual basis.

In order to help reduce the maximum Error Rate, the Plan Processor will measure the Error Rate on each business day and must take the following steps in connection with error reporting: (1) the Plan Processor will provide CAT Reporters with their error reports as they become available and daily statistics will be provided after data has been uploaded and validated by the Central Repository; (2) error reports provided to CAT Reporters will include descriptive details as to why each data record was rejected by the Central Repository; and (3) on a monthly basis, the Plan Processor will produce and publish reports detailing performance and comparison statistics, similar to the Report Cards published for OATS presently, which will enable CAT Reporters to identify how they compare to the rest of their industry peers and help them assess the risk related to their reporting of transmitted data.

All CAT Reporters exceeding the Error Rate will be notified each time that they have exceeded the maximum allowable Error Rate and will be informed of the specific reporting requirements that they did not fully meet (e.g., timeliness or rejections). Upon request from the Participants or other regulators, the Plan Processor will produce and provide reports containing Error Rates and other metrics as needed on each CAT Reporter's Compliance Thresholds so that

⁹⁸ SEC Rule 613(e)(6)(i) defines "Error Rate" to mean "[t]he percentage of reportable events collected by the central repository for which the data reported does not fully and accurately reflect the order event that occurred in the market." All CAT Reporters, including the Participants, will be included in the Error Rate. CAT Reporters will be required to meet separate compliance thresholds, which will be a CAT Reporter-specific rate that may be used as the basis for further review or investigation into CAT Reporter performance (the "Compliance Thresholds"). Compliance Thresholds will compare a CAT Reporter's error rate to the aggregate Error Rate over a period of time to be defined by the Operating Committee. See *infra* note 109 and accompanying text (discussing Compliance Thresholds). A CAT Reporter's performance with respect to the Compliance Threshold will not signify, as a matter of law, that such CAT Reporter has violated SEC Rule 613 or the rules of any Participant concerning the CAT.

⁹⁹ As indicated by FINRA in its comment to the Adopting Release, OATS compliance rates have steadily improved as reporters have become more familiar with the system. When OATS was first adopted compliance rates were 76%, but current compliance rates are 99%. See Letter from Marcia E. Asquith, Senior Vice President and Corporate Secretary, FINRA, to Elizabeth M. Murphy, Secretary, Commission (Aug. 9, 2010).

¹⁰⁰ Adopting Release at 45790-91.

the Participants as Participants or the SEC may take appropriate action for failing to comply with the reporting obligations under the CAT NMS Plan and SEC Rule 613.

SEC Rule 613(e)(6) requires the prompt correction of data to the Central Repository. As discussed in the NMS Plan, there are a minimum of three validation processes that will be performed on data submitted to the Central Repository. The Plan Processor will be required to identify specific validations and metrics to define the Data Quality Governance requirements, as defined in Appendix D, Receipt of Data from Reporters.

The Plan Processor will identify errors on CAT file submissions that do not pass the defined validation checks above and conform to the Data Quality Governance requirements. Error Rates will be calculated during the CAT Data and linkage validation processes. As a result, the Participants propose an initial maximum overall Error Rate of 5%¹⁰¹ on initially submitted data, subject to quality assurance testing period performed prior to launch.¹⁰² It is anticipated that this Error Rate will be evaluated when Industry Members, excluding Small Industry Members, begin to report to the Central Repository and then again when Small Industry Members begin to report to the Central Repository.

In determining the initial maximum Error Rate of 5%, the Participants have considered the current and historical OATS Error Rates, the magnitude of new reporting requirements on the CAT Reporters and the fact that many CAT Reporters may have never been obligated to report data to an audit trail.

The Participants considered industry experience with FINRA's OATS system over the last 10 years. During that timeframe there have been three major industry impacting releases. These three releases are known as (1) OATS Phase III, which required manual orders to be reported to OATS;¹⁰³ (2) OATS for OTC Securities which required OTC equity securities to be reported to OATS;¹⁰⁴ and (3) OATS for NMS which required all NMS stocks to be reported to OATS.¹⁰⁵ Each of these releases was accompanied by significant updates to the required formats which required OATS reporters to update and test their reporting systems and infrastructure.

The combined average error rates for the time periods immediately following release across five significant categories for these three releases follow. The average rejection percentage rate, representing order events that did not pass systemic validations, was 2.42%. The average late percentage rate, representing order events not submitted in a timely manner, was 0.36%. The average order / trade matching error rate, representing OATS Execution Reports unsuccessfully matched to a TRF trade report was 0.86%. The average Exchange/Route

¹⁰¹ As required by SEC Rule 613(e)(6)(ii), the Error Rate will be calculated on a daily basis as the number of erroneous records divided by the total number of records received on any given day and will be inclusive of validation of CAT Data and linkage validations. Error Rates are calculated for reporting groups as a whole, not for individual firms. Individual firms within a reporting group may have higher or lower Error Rates, though they would still be subject to any penalties or fines for excessive Error Rates to be defined by the Operating Committee. Additionally, this Error Rate will be considered for the purpose of reporting metrics to the SEC and the Operating Committee and individual firms will need to maintain Compliance Thresholds as described below.

¹⁰² The Participants expect that error rates after reprocessing of error corrections will be *de minimis*.

¹⁰³ See FINRA, OATS Phase III, <http://www.finra.org/Industry/Compliance/MarketTransparency/OATS/PhaseIII/>.

¹⁰⁴ See FINRA, OATS Reporting Requirements to OTC Equity Securities, <http://www.finra.org/Industry/Compliance/MarketTransparency/OATS/OTCEquitySecurities/>.

¹⁰⁵ See FINRA, OATS Expansion to all NMS Stocks, <https://www.finra.org/Industry/Compliance/MarketTransparency/OATS/NMS/>.

matching error rate, representing OATS Route Reports unsuccessfully matched to an exchange order was 3.12%. Finally, the average Interfirm Route matching error rate, representing OATS Route Reports unsuccessfully matched to a report representing the receipt of the route by another reporting entity was 2.44%. Although the error rates for the 1999 initial OATS implementation were significantly higher than those laid out above, the Participants believe that technical innovation and institutional knowledge of audit trail creation over the past 15 years makes the more recent statistics a better standard for the initial Error Rate.¹⁰⁶ Based upon these historical error rates, and given that reporting to the Central Repository will involve reporting on new products (i.e., options) and reporting by new reporters (including both broker-dealers and Participants who have not previously been required to report to OATS), the Participants believe that the initial Error Rate will be higher than the recent rates associated with OATS releases and that an initial Error Rate of 5% is an appropriate standard.

The Participants believe that to achieve this Error Rate, however, the Participants and the industry must be provided with ample resources, including a stand-alone test environment functionally equivalent to the production environment, and time to test their reporting systems and infrastructure. Additionally, the Technical Specifications must be well written and effectively communicated to the reporting community with sufficient time to allow proper technical updates, as necessary. The Participants believe that the Error Rate strikes the balance of adapting to a new reporting regime, while ensuring that the data provided to regulators will be capable of being used to conduct surveillance and market reconstruction, as well as having a sufficient level of accuracy to facilitate the retirement of existing regulatory reports and systems where possible.

The Participants are proposing a phased approach to lowering the maximum Error Rate. Under the proposed approach, one year after a CAT Reporter’s respective filing obligation has begun, their maximum Error Rate would become 1%.¹⁰⁷ Maximum Error Rates under the proposed approach would thus be as follows:

	One Year ¹⁰⁸	Two Years	Three Years	Four Years
Participants	5%	1%	1%	1%
Large broker-dealers	N/A	5%	1%	1%
Small broker-dealers	N/A	N/A	5%	1%

In addition to the above mentioned daily Error Rate, CAT Reporters will be required to meet separate Compliance Thresholds,¹⁰⁹ which rather than the Error Rate, will be a CAT Reporter-specific rate that may be used as the basis for further review or investigation into CAT Reporter performance. Although Compliance Thresholds will not be calculated on a daily basis, this does not: (1) relieve CAT Reporters from their obligation to meet daily reporting requirements set forth in SEC Rule 613; or (2) prohibit disciplinary action against a CAT

¹⁰⁶ The initial rejection rates for OATS were 23% and a late reporting rate of 2.79%.

¹⁰⁷ Error rate reporting will be bifurcated by reporter group (e.g., Large Broker/Dealers) rather than product type to minimize the complexity of Error Rate calculations

¹⁰⁸ As used in this table, “years” refer to years after effectiveness of the NMS Plan.

¹⁰⁹ Compliance Thresholds will be set by the Operating Committee. Compliance Thresholds for CAT Reporters will be calculated at intervals to be set by the Operating Committee. All CAT Reporters, including the Participants, will be subject to Compliance Thresholds. Compliance Thresholds will include, among other items, compliance with clock synchronization requirements.

Reporter for failure to meet its daily reporting requirements set forth in SEC Rule 613. The Operating Committee may consider other exceptions to this reporting obligation based on demonstrated legal or regulatory requirements or other mitigating circumstances.

In order to reduce the maximum Error Rate and help CAT Reporters to meet their Compliance Thresholds, the Plan Processor must provide support for CAT Reporter “go-live” dates, as specified in Appendix D, User Support.

(c) Sequencing Orders and Clock Synchronization

SEC Rule 613(c)(1) requires the Central Repository to provide “an accurate, time-sequenced record of orders,” and SEC Rule 613(d)(1) requires the CAT NMS Plan to require each CAT Reporter “to synchronize its business clocks that are used for the purposes of recording the date and time of any reportable event . . . to the time maintained by the National Institute of Standards and Technology (NIST), consistent with industry standards.” As an initial matter, because of the drift between clocks, an accurately-sequenced record of orders cannot be based solely on the time stamps provided by CAT Reporters. As discussed above, the CAT NMS Plan requires that CAT Reporters synchronize their clocks to within 50 milliseconds of the NIST. Because of this permitted drift, any two separate clocks can vary by 100 milliseconds: one clock can drift forward 50 milliseconds while another can drift back 50 milliseconds. Thus, it is possible to have, for example, one firm report the route of an order at 10:40:00.005 while the firm receiving the routed order reports a receipt time of 10:39:59.983 (i.e., the time stamps alone indicate that the routed order was received before it was sent). For this reason, the Participants plan to require that the Plan Processor develop a way to accurately track the sequence of order events without relying entirely on time stamps.¹¹⁰

There were several different approaches suggested by the Bidders to accomplish the accurate sequencing of order events. Some Bidders suggested using time stamp-based sequencing; however, most Bidders recognized that, while all CAT Reporters should have their time stamp clocks synchronized, in practice this synchronization cannot be wholly relied upon due to variations in computer systems. These Bidders rely on linkage logic to derive the event sequencing chain, such as parent/child orders. To help resolve time stamp issues, one Bidder proposed adding unique sequence ID numbers as well to the event information to help with time clock issues and a few others would analyze the variations on clock time and notify those CAT Reporters that need to resynchronize their clocks.

The Participants believe that using a linking logic not dependent on time stamps would enable proper sequencing of an order. This decision is supported by the industry since time stamps across disparate systems cannot be guaranteed and are likely to be error-prone.¹¹¹ The Participants believe that this type of sequencing can be successfully used for both simple and complex orders that will be reported to the Central Repository. The industry supports using

¹¹⁰ Events occurring within a single system that uses the same clock to time stamp those events should be able to be accurately sequenced based on the time stamp. For unrelated events, e.g., multiple unrelated orders from different broker-dealers, there would be no way to definitively sequence order events within the allowable clock drift as defined in Article 6.8.

¹¹¹ See Letter from Manisha Kimmel, Executive Director, Financial Information Forum, to Participant Representatives of the CAT (June 12, 2013), available at <http://catnmsplan.com/industryFeedback/P284394> (“FIF Letter”).

event sequencing that is already built into the exchange protocols, which imposes sequencing and determines the true market environment.¹¹²

As required by Section 6.8(a) of the CAT NMS Plan, each Participant will synchronize its Business Clocks (other than Business Clocks used solely for Manual Order Events, which will be required to be synchronized to within one second of the time maintained by the NIST) used for the purposes of recording the date and time of any Reportable Event that must be reported under SEC Rule 613 to within 50 milliseconds of the time maintained by the NIST, and will adopt a Compliance Rule requiring its Industry Members to do the same. Furthermore, in order to ensure the accuracy of time stamps for Reportable Events, the Participants anticipate that Participants and Industry Members will adopt policies and procedures to verify such required synchronization each Trading Day (1) before the market opens and (2) periodically throughout the Trading Day.

As noted above, Rule 613(d)(1) requires the CAT NMS Plan to impose a clock synchronization requirement “consistent with industry standards.” The Participants believe that the 50 millisecond clock synchronization drift tolerance included in Section 6.8(a) represents the current industry clock synchronization standard and therefore satisfies the Rule. To determine the current industry standard, the Participants relied on survey feedback provided by industry members, as further discussed in Appendix C, D.12.

Importantly, Section 6.8 requires, pursuant to Rule 613(c)(2), that Participants, together with the Plan Processor’s Chief Compliance Officer, evaluate the clock synchronization standard on an annual basis to reflect changes in industry standards. Accordingly, to the extent existing technology that synchronizes business clocks with a lower tolerance (i.e., within less than 50 milliseconds drift from NIST) becomes widespread enough throughout the industry to constitute a new standard, the clock synchronization requirement of the CAT NMS Plan would be revised to take account of the new standard.

In accordance with SEC Rule 613(d), Section 6.8(c) of the CAT NMS Plan states that “[i]n conjunction with Participants and other appropriate Industry Member advisory groups, the Chief Compliance Officer shall annually evaluate whether industry standards have evolved such that: (i) the synchronization standard in Section 6.8(a) should be shortened; or (ii) the required time stamp in Section 6.8(b) should be in finer increments.”

The Participants anticipate that compliance with this provision will require Participants and Industry Members to perform the following or comparable procedures. The Participants and their Industry Members will document their clock synchronization procedures and maintain a log recording the time of each clock synchronization performed, and the result of such synchronization, specifically identifying any synchronization revealing that the discrepancy between its Business Clock and the time maintained by the NIST exceeded 50 milliseconds. At all times such log will include results for a period of not less than five years ending on the then current date.

In addition to clock synchronization requirements, the Participants considered the appropriate level of time granularity to be required in the CAT NMS Plan. Although millisecond

¹¹² FIF Letter at 11.

increments are generally the industry standard for trading systems, there is a wide range of time stamp granularity across the industry commonly ranging from seconds to milliseconds to microseconds for Latency sensitive applications.¹¹³ The disparity is largely attributed to the age of the system being utilized for reporting, as older systems cannot cost effectively support, finer time stamp granularity.¹¹⁴ To comply with a millisecond time stamp requirement, the Participants understand that firms may face significant costs in both time and resources to implement a consistent time stamp across multiple systems.¹¹⁵ This may include a need to upgrade databases, internal messaging applications/protocols, data warehouses, and reporting applications to enable the reporting of such time stamps to the Central Repository.¹¹⁶ Because of this, FIF recommended to the Participants a two year grace period for time stamp compliance.¹¹⁷ FIF and SIFMA also supported an exception for millisecond reporting for order events that are manually processed, which is discussed below.¹¹⁸

To the extent that any CAT Reporter uses time stamps in increments finer than the minimum required by the CAT NMS Plan, each Participant will, and will adopt a rule requiring its Industry Members that are CAT Reporters to, use such finer increments when providing data to the Central Repository.

With respect to the requirement under SEC Rule 613(c) and (d)(3) that time stamps “reflect current industry standards and be at least to the millisecond,” the Participants believe that time stamp granularity to the millisecond reflects current industry standards. However, after careful consideration, including numerous discussions with the DAG, the Participants have determined that time stamp granularity at the level of a millisecond is not practical for order events that involve non-electronic communication of information (“Manual Order Events”). In particular, it is the Participants’ understanding that recording Manual Order Events to the millisecond would be both very costly, requiring specialized software configurations and expensive hardware, and inherently imprecise due to the manner in which human interaction is required. The industry feedback that the Participants received through the DAG suggests that the established business practice with respect to Manual Order Events is to manually capture time stamps with granularity at the level of a second because finer increments cannot be accurately captured when dealing with manual processes which, by their nature, take longer to perform than a time increment of under one second. The Participants agree that, due to the nature of transactions originated over the phone, it is not practical to attempt granularity finer than one second, as any such finer increment would be inherently unreliable. Further, the Participants do not believe that recording Manual Order Events to the second will hinder the ability of regulators to determine the sequence in which Reportable Events occur.

As a result of these discussions, the Exemptive Request Letter requested exemptive relief from the Commission to allow the CAT NMS Plan to require Manual Order Events to be captured with granularity of up to and including one second or better, but also require CAT Reporters to report the time stamp of when a Manual Order Event was captured electronically in

¹¹³ Letter from T.R. Lazo, Managing Director, SIFMA, and Thomas Price, Managing Director, SIFMA (June 11, 2013), *available at* <http://catnmsplan.com/industryFeedback/P284395> (“SIFMA Letter”); FIF Letter at 10.

¹¹⁴ FIF Letter at 10.

¹¹⁵ FIF Letter at 10; SIFMA Comments on Selected Topics at 11.

¹¹⁶ FIF Letter at 10.

¹¹⁷ FIF Letter at 10.

¹¹⁸ FIF Letter at 10; SIFMA Letter at 11.

the relevant order handling and execution system of the party to the event. Granularity of the Electronic Capture Time will be consistent with the SEC Rule 613(d)(3) requirement that time stamps be at least to the millisecond.

Thus, the Participants have determined that adding the Electronic Capture Time would be beneficial for successful reconstruction of the order handling process and would add important information about how the Manual Order Events are processed once they are entered into an electronic system. Additionally, Manual Order Events, when reported, must be clearly identified as such.

(d) Data Maintenance and Management

Data Maintenance and Management of the Central Repository “refers to the process for storing data at the [C]entral [R]epository, indexing the data for linkages, searches, and retrieval, dividing the data into logical partitions when necessary to optimize access and retrieval, and the creation and storage of data backups.”¹¹⁹

The Plan Processor must create a formal records retention policy to be approved by the Operating Committee. All of the data (including both corrected and uncorrected or rejected data) in the Central Repository must be kept online for a rolling six year period, which would create a six year historical audit trail. This data must be directly available and searchable by regulators electronically without any manual intervention. Additionally, the Plan Processor is required to create and maintain for a minimum of six years a symbol history and mapping table, as well as to provide a tool that will display a complete issue symbol history that will be accessible to CAT Reporters, Participants and the SEC.

Assembled lifecycles of order events must be stored in a linked manner so that each unique event (e.g., origination, route, execution, modification) can be quickly and easily associated with the originating customer(s) for both targeted queries and comprehensive data scans. For example, an execution on an exchange must be linked to the originating customer(s) regardless of how the order may have been aggregated, disaggregated, or routed through multiple broker-dealers before being sent to the exchange for execution.

Most Bidders recommended dividing data in the Central Repository into nodes based on symbol, date or a combination thereof in order to speed query response times. The Participants are not specifying how the data is divided, but will require that it be partitioned in a logical manner in order to optimize access and retrieval.

All of the Bidders addressed data loss through data replication and redundancy. Some of the Bidders proposed a hot-hot design for replication for primary and secondary data, so both sites are fully operational at all times and there would be no recovery time necessary in the case of fall-over to the secondary site. However, this is a more costly solution, and many Bidders therefore proposed data loss prevention by operating in a hot-warm design for replication to a secondary site. The Participants are requiring that the Plan Processor implement a disaster recover capability that will ensure no loss of data and will support the data availability

¹¹⁹ Adopting Release at 45790 n.782.

requirements for the Central Repository and a secondary processing site will need to be capable of recovery and restoration of services at the secondary site within 48 hours of a disaster event.

(e) Data Access by Regulators

As detailed in Appendix C, Time and Method by which CAT Data will be Available to Regulators, the Participants and other regulators will have access to raw unprocessed data that has been ingested by the Central Repository prior to Noon Eastern Time on T +1.¹²⁰ Between Noon Eastern Time on T +1 and T+5, the Participants and other regulators should have access to all iterations of processed data.¹²¹ At T+5, the Participants and other regulators should have access to corrected data.¹²² The Plan Processor must adopt policies and procedures to reasonably inform Participants and the SEC of material data corrections made after T+5. The Participants and other regulators will be able to build and generate targeted queries against data in the Central Repository. More information about the report, query, and extraction capabilities can be found in Appendix D, Functionality of the CAT System.

(f) Data Recovery and Business Continuity

As noted above, in addition to describing data security and confidentiality, all of the Bidders were required to set forth an approach to data loss recovery and business continuity in the event of data loss. All of the Bidders addressed data loss through data replication and redundancy. Some of the Bidders proposed a hot-hot design for replication for primary and secondary data, so both sites are fully operational at all times and there would be no recovery time necessary in the case of fall-over to the secondary site. However, this is a more costly solution, and many Bidders therefore proposed data loss prevention by operating in a hot-warm design for replication to a secondary site.

The Plan Processor must comply with industry best practices for disaster recovery and business continuity planning, including the standards and requirements set forth in Appendix D, BCP / DR Process.

With respect to business continuity, the Participants have developed the following requirements that the Plan Processor must meet. In general, the Plan Processor will implement efficient and cost-effective backup and disaster recovery capability that will ensure no loss of data and will support the data availability requirements and anticipated volumes of the Central Repository. The disaster recovery site must have the same level of availability / capacity / throughput and data as the primary site. In addition, the Plan Processor will be required to design a Business Continuity Plan that is inclusive of the technical and business activities of the Central Repository, including the items specified in Appendix D, BCP / DR Process (e.g., bi-annual DR testing and an annual Business Continuity Audit).

4. The Security and Confidentiality of the Information Reported to the Central Repository (SEC Rule 613(a)(1)(iv))

¹²⁰ See Appendix C, Time and Method by which CAT Data will be Available to Regulators.

¹²¹ *Id.*

¹²² *Id.*

As required by SEC Rule 613(a)(1)(iv), this section describes the security and confidentiality of the information reported to the Central Repository. As the Commission noted in the Adopting Release, keeping the data secure and confidential is critical to the efficacy of the Central Repository and the confidence of market participants. There are two separate categories for purposes of treating data security and confidentiality: (1) PII; and (2) other data related to orders and trades reported to the CAT.¹²³

Because of the importance of data security, the Participants included in the RFP numerous questions to Bidders requesting detailed information on their data security approaches. In the RFP, the Participants requested general information regarding the following:

- how the Bidder's solution protects data during transmission, processing, and at rest (i.e., when stored in the Central Repository);¹²⁴
- the specific security governance/compliance methodologies utilized in the proposed solution;¹²⁵
- how access to the data is controlled and how the system(s) confirms the identity of persons (e.g., username/password), monitors who is permitted to access the data and logs every instance of user access;¹²⁶
- what system controls for users are in place to grant different levels of access depending on their role or function;¹²⁷
- the strategy, tools and techniques, and operational and management practices that will be used to maintain security of the system;¹²⁸
- the proposed system controls and operational practices;¹²⁹
- the organization's security auditing practices, including internal audit, external audit, third-party independent penetration testing, and all other forms of audit and testing;¹³⁰
- how security practices may differ across system development lifecycles and environments that support them (e.g., development, testing, and production);¹³¹

¹²³ Some trade data (e.g., trade data feeds disseminated by the SIPs) is public and therefore of little concern from a security standpoint. However, because this data may be linked to confidential order data or other non-public information, the Participants are requiring the Plan Processor to store this public data in the same manner as the non-public order and trade information submitted to the Central Repository by Data Submitters.

¹²⁴ RFP Question 65.

¹²⁵ RFP Question 66.

¹²⁶ RFP Question 67.

¹²⁷ RFP Question 68.

¹²⁸ RFP Question 69.

¹²⁹ RFP Question 70.

¹³⁰ RFP Question 71.

¹³¹ RFP Question 72.

- experiences in developing policies and procedures for a robust security environment, including the protection of PII;¹³²
- the use of monitoring and incident handling tools to log and manage the incident handling lifecycle;¹³³
- the approach(es) to secure user access, including security features that will prevent unauthorized users from accessing the system;¹³⁴
- the processes/procedures followed if security is breached;¹³⁵
- the infrastructure security architecture, including network, firewalls, authentication, encryption, and protocols; and¹³⁶
- the physical security controls for corporate, data center and leased data center locations.¹³⁷

All Bidders acknowledged the importance of data security; however, the proposals varied in the details about security policies, data access management, proactive monitoring and intrusion prevention, and how data security will be implemented. Some Bidders intend to leverage their experience in financial services and adopt their policies and technologies to control data, and many Bidders supported such measures as role-based access controls, two factor authentication, detailed system logs, and segmentation of sensitive data that is isolated in both logical and physical layers. Other Bidders indicated that they would use role-based security policies, data and file encryption, and redundant and layered controls to prevent unauthorized access. Additionally, Bidders noted that the physical locations at which data is stored need security measures to ensure data is not compromised. Some Bidders indicated that physical controls would include background checks for employees working with the system; physical building security measures (e.g., locks, alarms, key control programs, CCTV monitoring for all critical areas, and computer controlled access systems with ID badges).

The RFP also requested additional information specific to the treatment and control over PII. The RFP required Bidders to specifically address:

- how PII will be stored;¹³⁸ and
- how PII access will be controlled and tracked.¹³⁹

All of the Bidders proposed segregating PII from the other data in the Central Repository. Additionally, all of the Bidders recommended limiting access to PII to only those regulators who

¹³² RFP Question 75.

¹³³ RFP Question 76.

¹³⁴ RFP Question 77.

¹³⁵ RFP Question 78.

¹³⁶ RFP Question 79.

¹³⁷ RFP Question 80.

¹³⁸ RFP Question 5.

¹³⁹ RFP Question 6.

need to have access to such information, and requiring additional validations to access PII. Although all Bidders proposed to keep a log of access to the Central Repository by user, the Bidders suggested different methods of authentication and utilized varying security policies, including the use of VPNs or HTTPS.

The RFP also requested information from Bidders on data loss prevention (“DLP”) and business continuity to ensure the continued security and availability of the data in the Central Repository. Specifically, the RFP asked Bidders to describe:

- their DLP program;¹⁴⁰ and
- the process of data classification and how it relates to the DLP architecture and strategy.¹⁴¹

Based upon the RFP responses, as well as input from the Participants’ information security teams and discussions with the DAG, information security requirements were developed and are defined in Appendix D, Data Security. These requirements are further explained below.

(a) General Security Requirements

SEC Rule 613 requires that the Plan Processor ensure the security and confidentiality of all information reported to and maintained by the Central Repository in accordance with the policies, procedures, and standards in the CAT NMS Plan.¹⁴² Based on the numerous options and proposals identified by the Bidders, the Participants have outlined multiple security requirements the Plan Processor will be required to meet to ensure the security and confidentiality of data reported to the Central Repository. The Plan Processor will be responsible for ensuring the security and confidentiality of data during transmission and processing as well as data at rest.

The Plan Processor must provide a solution addressing physical security controls for corporate, data center and any leased facilities where any of the above data is transmitted or stored. In addition to physical security, the Plan Processor must provide for data security for electronic access by outside parties, including Participants and the SEC and, as permitted, CAT Reporters or Data Submitters. Specific requirements are detailed in Appendix D, Data Security, and include requirements such as role-based user access controls, audit trails for data access, and additional levels of protection for PII.

Pursuant to SEC Rule 613(i)(C), the Plan Processor has to develop and maintain a comprehensive security program for the Central Repository with dedicated staff: (1) that is subject to regular reviews by the Chief Compliance Officer; (2) that has a mechanism to confirm the identity of all persons permitted to access the data; and (3) that maintains a record of all such

¹⁴⁰ RFP Question 73. The Bidders were asked to include information pertaining to strategy, tools and techniques, and operational and management practices that will be used.

¹⁴¹ RFP Question 74.

¹⁴² SEC Rule 613(e)(4). This section of Appendix C provides an outline of the policies and procedures to be implemented. When adopting this requirement, the Commission recognized “the utility of allowing the [Participants] flexibility to subsequently delineate them in greater detail with the ability to make modifications as needed.” Adopting Release at 45782. Additional detail is provided in Appendix D, Data Security.

instances where such persons access the data. In furtherance of this obligation, the CAT NMS Plan requires the Plan Processor to designate a Chief Compliance Officer and a Chief Information Security Officer, each subject to approval by the Operating Committee. Each position must be a full-time position. Section 6.2(a) of the CAT NMS Plan provides that the Chief Compliance Officer must develop a comprehensive compliance program covering all CAT Reporters, including the Participants and Industry Members.¹⁴³ Section 6.2(b) of the CAT NMS Plan provides that the Chief Information Security Officer shall be responsible for creating and enforcing appropriate policies, procedures, standards and control structures to monitor and address data security issues for the Plan Process and the CAT System as detailed in Appendix D, Data Security.

Section 6.12 of the CAT NMS Plan requires that the Plan Processor develop and maintain a comprehensive information technology security program for the Central Repository, to be approved and reviewed at least annually by the Operating Committee. To effectuate these requirements, Appendix D sets forth certain provisions designed to (1) limit access to data stored in the Central Repository to only authorized personnel and only for permitted purposes; (2) ensure data confidentiality and security during all communications between CAT Reporters and the Plan Processor, data extractions, manipulation and transformation, loading to and from the Central Repository, and data maintenance by the Central Repository; (3) require the establishment of secure controls for data retrieval and query reports by Participants' regulatory staff and the SEC; and (4) otherwise provide appropriate database security for the Central Repository. Section 6.2(a) of the CAT NMS Plan provides that the Chief Compliance Officer, in collaboration with the Chief Information Security Officer, will retain independent third parties with appropriate data security expertise to review and audit on an annual basis the policies, procedures, standards, and real time tools that monitor and address data security issues for the Plan Processor and the Central Repository.¹⁴⁴

The Plan Processor must have appropriate solutions and controls in place to ensure data confidentiality and security during all communication between CAT Reporters and the CAT System, data extraction, manipulation and transformation, loading to and from the Central Repository and data maintenance by the system. The solution must also address secure controls for data retrieval and query reports by Participant regulatory staff and the SEC. The solution must provide appropriate tools, logging, auditing and access controls for different components of the system, such as access to the Central Repository, access for CAT Reporters, access to rejected data, processing status and CAT Reporter calculated Error Rates.

In addition, pursuant to SEC Rule 613(e)(4)(i)(C)(2), the Plan Processor will develop and maintain a mechanism to confirm the identity of all persons permitted to access the data. The Plan Processor is responsible for defining, assigning and monitoring CAT Reporter entitlements. Similarly, pursuant to SEC Rule 613(e)(4)(i)(C)(3), the Plan Processor will record all instances where a person accesses the data.

Pursuant to SEC Rule 613(e)(4)(i)(B), Section 6.5(e)(ii) of the CAT NMS Plan requires each Participant to adopt and enforce rules that require information barriers between its

¹⁴³ See Section 6.2(a)(v) of the CAT NMS Plan for a more detailed list of the activities to be performed by the Chief Compliance Officer.

¹⁴⁴ See SEC Rule 613(e)(5).

regulatory staff and non-regulatory staff with regard to access to and use of data in the Central Repository, and permit only persons designated by such Participants to have access to and use of the data in the Central Repository.

The Plan Processor will also develop a formal cyber incident response plan to provide guidance and direction during security incidents, and will also document all information relevant to any security incidents, as detailed in Appendix D, Data Security.

(b) PII

As noted above, because of the sensitivity of PII, the Participants have determined PII should be subject to more stringent standards and requirements than other order and trading data. In response to the RFP questions, many Bidders mentioned that a range of techniques were required to ensure safety of PII. These techniques included development of PII policies and managerial processes for use by Plan Processor as well as Participants' staff and the SEC, physical data center considerations and strong automated levels, such as application, mid-tier, database, and operating systems levels, and use of role-based access and other parameters such as time-limited, case-restricted, and compartmentalized privilege. Most Bidders advocated for separate storage of PII in a dedicated repository to reduce the ability for hacking events to occur.

In accordance with SEC Rule 613(e)(4)(i)(A), all Participants and their employees, as well as all employees of the Plan Processor, will be required to use appropriate safeguards to ensure the confidentiality of data reported to the Central Repository and not to use such data for any purpose other than surveillance and regulatory purposes. A Participant, however, may use the data that it reports to the Central Repository for regulatory, surveillance, commercial, or other purposes.

The Participants anticipate that access to PII will be limited to a "need-to-know" basis. Therefore, it is expected that access to PII associated with customers and accounts will have a much lower number of registered users, and access to this data will be limited to Participants' staff and the SEC who need to know the specific identity of an individual. For this reason, PII such as SSN and TIN will not be made available in the general query tools, reports, or bulk data extraction.¹⁴⁵ The Participants will require that the Plan Processor provide for a separate workflow granting access to PII (including an audit trail of such requests) that allows this information to be retrieved only when required by specific regulatory staff of a Participant or the SEC, including additional security requirements for this sensitive data. Specifically, the Plan Processor must take steps to protect PII as defined in Appendix D, Data Security and including items such as storage of PII separately from order and transaction data, multi-factor authentication for access to PII data, and a full audit trail of all PII data access.

It is anticipated that the Technical Specifications will set forth additional policies and procedures concerning the security of data reported to the Central Repository; however, any such

¹⁴⁵ As described in Appendix C, Reporting Data to the CAT, general queries can be carried out using the Customer-ID without the need to know specific, personally-identifiable information (i.e., who the individual Person associated with the Customer-ID is). The Customer-ID will be associated with the relevant accounts of that Person; thus, the use of Customer-ID for querying will not reduce surveillance.

policies and procedures must, at a minimum, meet the requirements set forth in the CAT NMS Plan and Appendix D.

5. The Flexibility and Scalability of the CAT (SEC Rule 613(a)(1)(v))

(a) Overview

As required by SEC Rule 613(a)(1)(v), this section discusses the flexibility and scalability of the systems used by the Central Repository to collect, consolidate and store CAT Data, including the capacity of the Central Repository to efficiently incorporate, in a cost-effective manner, improvements in technology, additional capacity, additional order data, information about additional Eligible Securities or transactions, changes in regulatory requirements, and other developments.

The Plan Processor will ensure that the Central Repository's technical infrastructure is scalable, adaptable to new requirements and operable within a rigorous processing and control environment. As a result, the technical infrastructure will require an environment with significant throughput capabilities, advanced data management services and robust processing architecture. The technical infrastructure should be designed so that in the event of a capacity upgrade or hardware replacement, the Central Repository can continue to receive data from CAT Reporters with no unexpected issues.

The Plan Processor will perform assessments of the Central Repository's technical infrastructure to ensure the technology employed therein continues to meet the functional requirements established by the Participants. The Plan Processor will provide such assessments to, and review such assessments with, the Operating Committee within one month of completion. The Operating Committee will set forth the frequency with which the Plan Processor is required to perform such assessments. The Operating Committee must approve all material changes / upgrades proposed by the Plan Processor before they can be acted upon. The Operating Committee may solicit feedback from the Advisory Committee for additional comments and/or suggestions on changes to the capacity study as the Operating Committee determines necessary.

The Central Repository will employ optimal technology for supporting (1) scalability to increase capacity to handle a significant increase in the volume of data reported, (2) adaptability to support future technology developments and new requirements and (3) maintenance and upgrades to ensure that technology is kept current, supported and operational.

Participants will provide metrics and forecasted growth to facilitate Central Repository capacity planning. The Plan Processor will maintain records of usage statistics to identify trends and processing peaks. The Central Repository's capacity levels will be determined by the Operating Committee and used to monitor resources, including CPU power, memory, storage, and network capacity.

The Plan Processor will ensure the Central Repository's compliance with all applicable service level agreements concerning flexibility and scalability of the Central Repository, including those specified in the CAT NMS Plan and by the Operating Committee.

(b) Approaches proposed by Bidders

Information received from Shortlisted Bidders indicated that all six Shortlisted Bidders considered incoming transaction volumes to be one of their most significant drivers of cost across hardware, software, and full-time employees (“FTEs”), with the expected rate of increase in transaction volumes and retention requirements also being prominent drivers of cost. The approaches described above will facilitate effective management of these factors to provide for a cost-effective and flexible Central Repository.

As noted in the RFP, the Bidders were required to provide comments on how the Central Repository would be scalable for growth in the following aspects: number of issues accepted by the CAT, types of messages accepted by the CAT, addition of fields stored on individual data records or increases in any data type due to market growth. The Bidders were also requested to describe how the system can be scaled up for peak periods and scaled down as needed.

Bidders using a network infrastructure of data collection hubs noted the use of Ethernet links throughout a single hub as a method of handling additional throughput and capacity. Other Bidders note access points will be load balanced, allowing for additional capacity. Some Bidders note the need for continued monitoring to facilitate timely addition of capacity or other upgrades. Other Bidders highlighted the ability to scale processing horizontally by adding nodes to the database structure which will allow for additional capacity. In this instance, adding nodes to an existing clustered environment allows for the preservation of processing speed in the existing processing environment. In a cloud solution, Bidders note the systems will scale automatically. That is, the processing load or capacity is determined at the instance the tool is ‘run’ by the processor.¹⁴⁶ Some Bidders broadly note that the selection of platform components or features of their proposed solution infrastructure was the key in developing a scalable system. It is further noted that the selection of these elements allows for technological upgrades to incorporate newer technologies without a system replacement. Bidders identify the use of additional server and storage capacity as a key proponent of providing a scalable system.

6. The Feasibility, Benefits, and Costs for Broker-Dealers Reporting Allocations in Primary Market Transactions to the Consolidated Audit Trail (SEC Rule 613(a)(1)(vi))

SEC Rule 613(a)(1)(vi) requires the Participants to assess the feasibility, benefits and costs of broker-dealers reporting to the consolidated audit trail in a timely manner:

- The identity of all market participants (including broker-dealers and customers) that are allocated NMS Securities, directly or indirectly, in a Primary Market Transaction;¹⁴⁷
- The number of such NMS Securities each such market participant is allocated; and
- The identity of the broker-dealer making each such allocation.¹⁴⁸

¹⁴⁶ See, e.g., Google Cloud Platform, <https://cloud.google.com/developers/articles/auto-scaling-on-the-google-cloud-platform/>.

¹⁴⁷ All observations and costs as provided in this section include secondary offerings.

¹⁴⁸ SEC Rule 613(a)(1)(vi).

The objective of this CAT NMS Plan is to provide a comprehensive audit trail that “allows regulators to efficiently and accurately track all activity in NMS securities throughout the U.S. markets.” The Participants believe that an eventual expansion of the CAT to gather complete information on Primary Market Transactions would be beneficial to achieving that objective. However, based on the analysis directed to be completed as part of this plan, the Participants have concluded that it is appropriate to limit CAT submissions related to allocations in Primary Market Transactions to sub-account allocations, as described below.

Specifically, based on comments received by the Participants on this and other topics related to the consolidated audit trail,¹⁴⁹ the Participants believe that information related to sub-account allocations – the allocation of shares in a primary market offering to the accounts that ultimately will own them – currently is maintained by broker-dealers in a manner that would allow for reporting to the Central Repository without unreasonable costs and could assist the Commission and the Participants in their regulatory obligations, including a variety of rulemaking and policy decisions. By contrast, the reporting of so-called “top account” information in Primary Market Transactions to the Central Repository would involve significantly more costs which, when balanced against the marginal benefit, is not justified at this time. These issues are discussed further below.

As a preliminary matter, the analysis required pursuant to this section is limited to Primary Market Transactions in NMS Securities that involve allocations. As the Commission has noted, “a primary market transaction is any transaction other than a secondary market transaction and refers to any transaction where a person purchases securities in an offering.”¹⁵⁰ The Participants understand that Primary Market Transactions generally involve two phases that implicate the allocation of shares. The “book building” phase involves the process “by which underwriters gather and assess investor demand for an offering of securities and seek information important to their determination as to the size and pricing of an issue.”¹⁵¹ This process may involve road shows to market an offering to potential investors, typically institutional investors, including the discussion of the prospective issuer, and its management and prospects. The book building phase also involves efforts by the underwriter to ascertain indications of interest in purchasing quantities of the underwritten securities at varying prices from potential investors.¹⁵² Using this and other information, the underwriter will then decide how to allocate IPO shares to purchasers. The Participants understand that these are so-called “top account” allocations – allocations to institutional clients or retail broker-dealers, and that such allocations are conditional and may fluctuate until the offering syndicate terminates. Sub-account allocations occur subsequently, and are made by top account institutions and broker-dealers prior to settlement. Sub-account allocations represent the allocation of IPO shares to the actual account receiving the shares and are based on an allocation process that is similar to secondary market transactions.¹⁵³

¹⁴⁹ Questions for Public Comment re the CAT NMS Plan (Apr. 22, 2013), *available at* <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p246652.pdf> (“April Request for Comment”).

¹⁵⁰ Adopting Release at 45792 n.792.

¹⁵¹ *See generally*, Securities Act Release No. 8565, 70 Fed. Reg. 19672 (Apr. 13, 2005) (Commission guidance regarding prohibited conduct in connection with IPO allocations) (“IPO Allocation Release”).

¹⁵² *Id.*

¹⁵³ *See* FIF Letter at 4.

(a) Feasibility

In the April 2013 Request for Comment, the Participants requested information on how firms handle Primary Market Transactions. In response to the request, FIF, SIFMA and Thomson Reuters submitted comments explaining current industry practice with respect to Primary Market Transactions.¹⁵⁴ Both SIFMA and FIF noted that broker-dealers generally maintain top account allocation information in book building systems that are separate from their systems for secondary market transactions and that differ across the industry, including the use of applications provided by third parties, in house systems and spreadsheets for small firms.¹⁵⁵ The Participants also understand that the investment banking divisions of broker-dealers typically use different compliance systems than those used for secondary market transactions.¹⁵⁶ The DAG also provided feedback¹⁵⁷ indicating that the impacted systems differ across the industry, given differing processes for Primary Market Transactions depending upon the structure of the deal, and that initial allocations are stored in book-building systems with varying levels of sophistication across the industry, including third-party systems, custom-built systems, and spreadsheets. The Participants thus believe that capturing indications of interest and other information about top account allocations in an accurate and consistent manner across the industry would be challenging.

By contrast, the Participants believe that it would be more feasible to gather information relating to sub-account allocations in Primary Market Transactions. The Participants understand that sub-account allocations are received in a manner and level of detail similar to allocations in secondary market transactions,¹⁵⁸ and that the same middle and back office systems that are used for the processing of sub-account allocations for secondary market transactions generally are also used for the sub-account allocations for Primary Market Transactions.¹⁵⁹ Similarly, sub-account allocations for Primary Market Transactions generally are maintained in an electronic format that could be converted into a reportable format acceptable for the CAT System. Therefore, these systems could more easily report information about sub-account allocations to the Central Repository than systems containing information regarding top-account allocations.

(b) Benefits

As the Commission notes, data about the final allocations of NMS Securities in Primary Market Transactions could improve compliance monitoring and market analyses by the Commission and the Participants, which, in turn, could help inform rulemaking and other policy

¹⁵⁴ See FIF Letter; SIFMA Letter; Thomson Reuters (May 21, 2013) (“Thomson Reuters Letter”), available at <http://catnmsplan.com/industryFeedback/>; see also Thomson Reuters Letter, <http://catnmsplan.com/industryFeedback/P284396> (systems used for primary market allocations differ from those used for secondary market transactions).

¹⁵⁵ FIF Letter at 4; SIFMA Letter at 3

¹⁵⁶ FIF Letter at 4. The Participants also understand that top account allocation systems do not generally have execution reporting capacity, since reporting of primary market transactions is not currently required under OATS and other transaction reporting systems. SIFMA Letter at 2.

¹⁵⁷ See DAG Cost Estimate for Adding Primary Market Transactions into CAT (Feb. 17, 2015), available at <http://catnmsplan.com/industryFeedback/P602480>.

¹⁵⁸ FIF Letter at 4.

¹⁵⁹ For example, commenters noted that “firms generally use the same clearance and settlement systems for clearing and settling final allocations in primary market transactions as they do for clearing and settling secondary market trades.” SIFMA Letter at 4.

decisions.¹⁶⁰ For example, such data could enhance the Commission's understanding of the role of the allocations in the capital formation process, when and how investors receiving allocations sell their Eligible Securities and how allocations differ among broker-dealers.¹⁶¹ Such data also could assist the Commission and Participants in conducting their respective examinations and investigations related to Primary Market Transactions.¹⁶²

The Participants believe that most of these potential benefits could be achieved through the gathering of information relating to sub-account allocations rather than top account information. For example, sub-account allocation information would aid the Commission and the Participants in gaining a better understanding of how shares allocated in Primary Market Transactions are sold in the secondary market, or how allocations differ across broker-dealers. By contrast, because top account information of conditional and interim allocations for NMS Securities fluctuates throughout the syndicate process and may vary significantly among firms, the marginal benefits of such information over final sub-account allocations are much less clear.

(c) Costs

The cost of reporting Primary Market Transaction information will depend on the scope of allocation information subject to the rule, as well as the related technology upgrades that would be necessary to report such information to the Central Repository. Based on the response of commenters, the Participants believe that reporting top account information about conditional allocations to the Central Repository would require significant technology enhancements. As noted above, current market practices capture top account allocations using systems and data sources that are different and separate from those used in secondary market transactions. Commenters also noted that there may be significant variability among underwriters in terms of the systems and applications used to gather such data.

The DAG provided cost estimates associated with the reporting of Primary Market Transactions.¹⁶³ These estimates indicated that to report both initial and sub-account allocations would cost the industry as a whole at least \$234.8 million¹⁶⁴ and require approximately 36 person-months per firm to implement. The DAG's estimate to report sub-account allocations only was approximately \$58.7 million¹⁶⁵ for the industry and would require approximately 12 person-months per firm to implement. The DAG commented that given the higher costs associated with reporting initial allocations, if Primary Market Transactions are required to be reported to the Central Repository, that only reporting final sub-account allocations be required.

¹⁶⁰ Adopting Release at 45792-93.

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ See *supra* note 157.

¹⁶⁴ Based upon an assumption of 12 person-months of business analysis, an implementation timeline of 3x the business analysis timeline, 21.741 person-days per month, a \$1,200 daily FTE rate, and a multiplier of 250 to reflect the costs of the 250 largest reporting firms. 12 person-months of analysis * 3 * 21.741 person-days per month * \$1,200 daily FTE rate = \$939,211 * 250 = \$234.8 million.

¹⁶⁵ Based upon an assumption of 3 person-months of business analysis, an implementation timeline of 3x the business analysis timeline, 21.741 person-days per month, a \$1,200 daily FTE rate, and a multiplier of 250 to reflect the costs of the 250 largest reporting firms. 3 person-months of analysis * 3 * 21.741 person-days per month * \$1,200 daily FTE rate = \$234,802 * 250 = \$58.7 million.

Based upon this analysis, the Participants are supportive of considering the reporting of Primary Market Transactions, but only at the sub-account level, and will incorporate analysis of this requirement, including how and when to implement such a requirement, into their document outlining how additional Eligible Securities could be reported to the Central Repository, in accordance with SEC Rule 613(i) and Section 6.11 of the Plan.

B. ANALYSIS OF THE CAT NMS PLAN. These considerations are intended to help inform the Commission about the cost for development, implementation and maintenance of the CAT and to help determine if such plan is in the public interest.

7. Analysis of Expected Benefits and Estimated Costs for Creating, Implementing, and Maintaining the Consolidated Audit Trail (SEC Rule 613(a)(1)(vii))

The analysis of expected benefits and estimated costs presented here is informed by the Commission's public guidance on conducting economic analysis in conjunction with SEC rulemaking.¹⁶⁶ The analysis begins with a statement of the need for regulatory action, describes the sources of information used in the analysis, and provides a description of the economic baseline used to evaluate the impacts associated with the CAT NMS Plan. The analysis then provides estimates of the costs to build, implement, and maintain the CAT, as contemplated, and ends with a description of the alternatives considered.

(a) Need for Regulatory Action

SEC Rule 613 further requires the Participants to consider and discuss in the CAT NMS Plan detailed estimated costs for creating, implementing, and maintaining the CAT as contemplated by the CAT NMS Plan. Specifically, SEC Rule 613 requires that the estimated costs should specify: (1) an estimate of the costs to the Participants in establishing and maintaining the Central Repository; (2) an estimate of the costs to broker-dealers, initially and on an ongoing basis, for reporting the data required by the CAT NMS Plan; (3) an estimate of the costs to the Participants, initially and on an ongoing basis, for reporting the data required by the CAT NMS Plan; and (4) the Participants' proposal to fund the creation, implementation, and maintenance of the CAT, including the proposed allocation of such estimated costs among the Participants and broker-dealers. Set forth below is a discussion of cost estimates, including the studies undertaken to obtain relevant data, as well as the proposed funding model.

(b) Economic Analysis

(i) Sources of Cost Information

Participants relied on two primary sources of information to estimate current audit trail costs (i.e., costs associated with the economic baseline), the costs incurred to meet the requirements of SEC Rule 613 for both the Participants and other CAT Reporters and the costs associated with the creation, implementation and maintenance of the CAT. First, to assess the

¹⁶⁶ See, e.g., Memorandum to File Re: Current Guidance on Economic Analysis in SEC Rulemakings (Mar. 16, 2012), available at http://www.sec.gov/divisions/riskfin/rsfi_guidance_econ_analy_seculemaking.pdf (outlining foundational elements of regulatory economic analysis).

costs associated with Participant and CAT Reporter obligations, Participants solicited study responses from Participants, broker-dealers and third party vendors. These three constituencies are the primary parties with direct costs arising from SEC Rule 613, as discussed further below. Second, to assess the costs associated with creating, implementing and maintaining the CAT, this analysis relies on estimated costs submitted by the Bidders as part of the bidding process.

(A) Studies

(1) Costs to Participants Study

The first study undertaken collected information from the Participants about current audit trail reporting costs under the existing regulatory reporting framework and the potential costs of reporting to the Central Repository (the “Costs to Participants Study”). Respondents were asked to estimate separately hardware, FTE staffing costs, and third party provider costs, where applicable. The study also requested information about costs associated with retiring current regulatory systems that would be rendered redundant by the CAT.

The Costs to Participants Study was distributed to the 19 Participants on August 11, 2014. The initial due date for responses was August 25, 2014; however due to the complexity of the data collection effort, the due date for the study was extended to September 24, 2014. Discussions with respondents suggested that at least some of the costs were more appropriate to measure at the level of the group of Affiliated Participants that hold multiple licenses (“Affiliated Participants Group”). Based on this approach, study results are presented for four Participants holding a single exchange registration and FINRA, which also is a Participant but is a registered securities association, and another five Affiliated Participants Groups representing the remaining fourteen registered exchanges. Subsequent to the filing of the CAT NMS Plan, the Participants determined that additional detail about anticipated costs could be provided to enhance the data collected as part of the Costs to Participants Study and a second data collection was conducted.

(2) Costs to CAT Reporters Study

The study sent to broker-dealers (the “Costs to CAT Reporters Study”) was distributed to 4,406 broker-dealers,¹⁶⁷ and requested estimates for current costs under the existing regulatory reporting framework as well as future costs for reporting to the Central Repository. Broker-dealer respondents were asked to estimate the future costs to report to the Central Repository under two separate scenarios.¹⁶⁸ Approach 1 described a scenario in which broker-dealers would submit data to the Central Repository using their choice of existing industry messaging protocols, such as the FIX protocol. Approach 2 provided a scenario in which broker-dealers would submit data to the Central Repository using a defined or specified format, such as an augmented version of OATS. For each approach, respondents were asked to estimate separately hardware, FTE staffing costs, and third party provider costs, where applicable. Finally, broker-

¹⁶⁷ A unique study link was distributed to 4,406 broker-dealers. For 381 of the broker-dealers, the distribution email either was undeliverable or the broker-dealer responded that the study did not apply to them.

¹⁶⁸ See SEC Rule 613 – Consolidated Audit Trail (CAT) Cost Study Overview and Assumptions, available at <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p535485.pdf>.

dealers were requested to provide the cost of retirement of existing systems to be replaced by the CAT.

The development of the Costs to CAT Reporters Study took place over two months, starting in May 2014, and included detailed discussions with the DAG. The Participants developed an initial outline of questions based on the requirements in SEC Rule 613, as well as a detailed assumptions document. To make the Costs to CAT Reporters Study effective and informative, the Participants spent two months formulating the Costs to CAT Reporters Study with detailed input from the DAG. The initial draft of the Costs to CAT Reporters Study was presented to the DAG in May 2014, and was discussed in two additional meetings with the DAG until mid-June 2014. In addition, on June 4, 2014, the Participants received and subsequently incorporated detailed written feedback from DAG members on the Costs to CAT Reporters Study and associated assumptions document.¹⁶⁹

The study link was sent on June 23, 2014, to the compliance contact at each recipient CAT Reporter identified by the applicable designated examining authority or designated options examining authority to receive regulatory update and information requests. The initial due date for the study was August 6, 2014. On June 25, 2014 and July 9, 2014, the Participants hosted a webinar¹⁷⁰ to review the materials associated with the Costs to CAT Reporters Study, and to answer any questions from the CAT Reporters. On July 17, 2014, July 30, 2014, and August 4, 2014, reminders were sent to the CAT Reporters to submit their final responses to the Costs to CAT Reporters Study by August 6, 2014. In addition, the Participants requested that industry associations that are part of the DAG encourage their members to respond to the Costs to CAT Reporters Study.

On August 6, 2014, the first extension was granted for the Costs to CAT Reporters Study, extending the due date to August 20, 2014. On August 20, 2014, an additional extension was granted, extending the due date to September 3, 2014.

During the process of collecting responses to the Costs to CAT Reporters Study, CAT Reporters were informed that all responses were captured on an anonymous basis and would only be reported to the Participants in an aggregated, anonymous format. The third party facilitator of the Costs to CAT Reporters Study reviewed all responses received through the study portal. Study respondents had the option of identifying their firm should additional follow-up be required; any such follow-up was undertaken by the third-party facilitator, as necessary, to enhance the overall quality of responses received.

The Participants received 422 responses. Of those responses, 180 were deemed to be materially incomplete¹⁷¹ and, thus, they were considered effectively nonresponsive. An additional 75 responses were determined to be clearly erroneous; for example the responses had repeating values that could not be used in analysis, or the magnitude of reported FTEs or other

¹⁶⁹ See Past Events and Announcements, SROs Launch Study to Analyze Implementation Cost of the Consolidated Audit Trail (last updated Dec. 10, 2014), *available at* <http://catnmsplan.com/PastEvents/>.

¹⁷⁰ See SEC Rule 613: Consolidated Audit Trail (CAT), SRO Hosted Consolidated Audit Trail Cost Study Webinar (July 9, 2014), *available at* <http://catnmsplan.com/PastEvents/P551992>.

¹⁷¹ Materially incomplete responses were those that provided responses for less than half of the cost-related questions.

costs was so high as to be considered an outlier¹⁷². As a result, the Participants excluded these incomplete and clearly erroneous responses from the data set, resulting in a population of 167 responses that was used for purposes of conducting the cost analysis described herein.

(3) Costs to Vendors Study

A study requested information from various service providers and vendors about the potential costs of reporting to the Central Repository (the “Costs to Vendors Study”). The Participants developed the content of the Costs to Vendors Study, based on the structure and content of the Costs to CAT Reporters Study. The distribution list for the Costs to Vendors Study was provided by the DAG, and was distributed to 13 service bureaus and technology vendors on August 13, 2014. The initial due date for responses was September 1, 2014; however, due to the complexity of the data collection effort, the due date for the study was extended to September 12, 2014. The Participants received five completed responses to the Costs to Vendors Study.

(B) Bidder Estimates

To estimate the costs to Participants for creating, implementing and maintaining the CAT, Bidders were asked to provide in their Bid documents total one-year and annual recurring cost estimates. As part of the RFP process, the Bidders were asked to provide a schedule of the anticipated total cost of creating, implementing and maintaining the CAT. As noted above in the Background Section of Appendix C, any one of the six Shortlisted Bidders could be selected as the Plan Processor and each Shortlisted Bidder¹⁷³ has proposed different approaches to various issues. The Bidder selected as the Plan Processor must meet the specific requirements set forth in the Plan and Appendix D and may be given the opportunity to revise its Bid prior to the final selection of a Plan Processor. Accordingly, the Participants anticipate that the cost estimates to create, implement and maintain the CAT may differ from what is set forth below.¹⁷⁴

In its final rule for the Consolidated Audit Trail, the Commission amended its proposal to include enhanced security and privacy requirements. Specifically, SEC Rule 613(e)(4) requires the NMS Plan to include policies and procedures, including standards, to be used by the Plan Processor to ensure the security and confidentiality of all information reported to the Central Repository. Participants did not ask Bidders to separately assess the costs associated with the enhanced security requirements in SEC Rule 613; rather these costs were embedded in the Bids as a component of the total costs.

The RFP requested that Bidders provide an estimate of the total one-time cost to build the CAT, including technological, operational, administrative, and any other material costs. The six

¹⁷² Responses were outliers if their values were two times greater than the next highest value.

¹⁷³ Section 5.2(b) of the CAT NMS Plan describes how the Participants selected the Shortlisted Bidders.

¹⁷⁴ More specifically, Participants anticipate that technology costs and technological solutions may evolve over the bidding process and may affect the Bids. For instance, one Bidder recently provided an update to the Participants, noting “We expect continued cost reductions as Moore’s Law is applied to cloud pricing and to have this bring down total cost to the industry on an ongoing basis.” As another example, evolving technologies for data security may either increase or decrease estimated costs.

Shortlisted Bidders provided estimates ranging from a low of \$30,000,000 to a high of \$91,600,000, with an average one-time cost of \$53,000,000.¹⁷⁵

The RFP also requested that Bidders provide an estimate of annual recurring operating and maintenance costs for the five year period following the selection of the Plan Processor, and an estimate of the annual peak year costs (i.e., cost for the year during which it will cost the most to operate the CAT). The six Shortlisted Bidders provided estimates ranging from a low of \$135,000,000 to a high of \$465,100,000 over the course of the first five years of operation, with an average five-year cost of \$255,600,000 and an average annual cost of \$51,100,000. Estimates of peak year recurring costs range from a low of \$27,000,000 to a high of \$109,800,000, with an average of \$59,400,000. The table presented below reports the low, median, average, and maximum expected costs for the build, maintenance, and peak year maintenance of the Central Repository arising from the Shortlisted Bids. These figures are subject to change as Bidders may update their cost estimates.

Bidder Estimates Summary				
	Minimum	Median	Mean	Maximum
Build Costs (One-time)	\$30,000,000	\$46,100,000	\$53,000,000	\$91,600,000
Maintenance Costs (Annual)	\$27,000,000	\$42,200,000	\$51,100,000	\$93,000,000
Maintenance Costs (5 year)	\$135,000,000	\$211,200,000	\$255,600,000	\$465,100,000
Peak Year Maintenance	\$27,000,000	\$52,400,000	\$59,400,000	\$109,800,000

The Participants note, however, that there may be a relation between the initial construction costs and maintenance costs based on technological choices, among other factors. To better compare estimates, the Participants are providing a range based on the reported combined build and annual recurring costs for the five year period following Plan Processor selection, discounted by a factor of 2%.¹⁷⁶ Estimates of total costs range from \$159,800,000 to \$538,700,000.

Participants sought insight into the economic drivers of the cost estimates from the Shortlisted Bidders. Specifically, Participants asked each Shortlisted Bidder to identify the factors, such as the amount of message traffic, complexity of order life cycles, number and complexity of Participant and Commission data requests and administration and support costs that were material to its Bid. Bidders identified the following as primary drivers of their Bid costs: (1) reportable volumes of data ingested into the Central Repository; (2) number of

¹⁷⁵ Due to the complexity of the cost estimation effort, all figures provided in this analysis section have been rounded to a reasonable degree of accuracy and should be considered approximate.

¹⁷⁶ The discount factor represents an estimate of the average yield on AAA-rated corporate debt for the month period August 28, 2014 to September 27, 2014. Costs anticipated to be accrued after the first year (years 2 through 5) are discounted back to the first year to permit Participants to compare the anticipated costs associated with different Bids on a constant dollar basis.

technical environments that would be have to be built to report to the Central Repository; (3) likely future rate of increase of reportable volumes; (4) data archival requirements; and (5) user support and/or help desk resource requirements.¹⁷⁷

(ii) Economic Baseline

In publishing SEC Rule 613, the Commission stated that it “believes that the regulatory infrastructure on which the Participants and the Commission currently must rely generally is outdated and inadequate to effectively oversee a complex, dispersed, and highly automated national market system.”¹⁷⁸ The purpose of the CAT NMS Plan is to develop, build and maintain a system that provides an infrastructure to appropriately monitor, surveil and oversee the national market system in its current state and provide sufficient flexibility to reasonably adjust for future financial market innovations.

Such a system will necessarily impact the Commission, Participants, potential future Participant entrants, broker-dealers and other market participants, issuers and investors. Each party may derive costs, benefits and other economic impacts, depending upon plan implementation, the relevant economic activities of each entity and the allocation of costs and responsibilities across those entities. These estimated costs, benefits, and other economic impacts must be assessed against the current economic baseline, capturing the existing state of regulatory audit trail activity in the markets. The economic baseline for different affected parties is described in greater detail below.

(A) Description of Current Audit Trail Reporting

Currently, separate audit trails exist within each exchange in addition to the audit trail requirements for FINRA members to report to OATS.¹⁷⁹ For equities, all broker-dealers that are members of FINRA must report their orders in NMS Stocks and OTC Equity Securities, including executions or cancellations, to OATS. Accordingly, for FINRA members, it is possible to match OATS reports to related exchange audit trail entries, provided that the related exchange has a regulatory services agreement with FINRA such that FINRA has access to the exchange data. Broker-dealers that are not FINRA members do not have a regular equity audit trail reporting requirement, although NYSE and NASDAQ member proprietary firms that are not FINRA members have an obligation to record OATS data and report to FINRA upon request. Additionally, each exchange creates its own audit trail for each order received that it receives and processes.

For options, the options exchanges utilize the Consolidated Options Audit Trail System (“COATS”) to obtain and review information on options transactions. COATS data includes trades, the National Best Bid and National Best Offer at the time of the trade and clearing information for customers at the clearing firm level. It also identifies clearing firm proprietary trading and individual marker maker transactions if they are reported correctly at the time of the trade. However, COATS does not include adjustment data from the Options Clearing Corporation; these adjustments include changes to either the account type or size of the position.

¹⁷⁷ Bidders indicated that user support costs primarily consisted of FTE costs.

¹⁷⁸ Adopting Release at 45723.

¹⁷⁹ See FINRA Rule 7410 *et seq.*

Additionally, order information is only available to the Commission upon request from the options exchanges. Currently reports need to be constructed based on order information received from the various options exchanges. As previously noted, only the National Best Bid and National Best Offer at the time of the trade is included in the COATS data; however, this is optional data that the exchanges may or may not provide. The options exchanges utilize their independent quote information to build their reports.

In sum, each equities and options exchange is built on its own unique platform, utilizes unique entry protocols and requirements and thus creates uniquely formatted audit trails.

The existence of multiple non-integrated audit trails has direct consequences on the accuracy and efficiency of regulatory oversight. The Commission has stated that:

...there are shortcomings in the completeness, accuracy, accessibility, and timeliness of these existing audit trail systems. Some of these shortcomings are a result of the disparate nature of the systems, which make it impractical, for example, to follow orders through their entire lifecycle as they may be routed, aggregated, re-routed, and disaggregated across multiple markets. The lack of key information in the audit trails that would be useful for regulatory oversight, such as the identity of the customers who originate orders, or even the fact that two sets of orders may have been originated by the same customer, is another shortcoming.¹⁸⁰

In addition, the Intermarket Surveillance Group's ("ISG") consolidated equity audit trail combines transaction data from all exchanges and is used by all Participants for surveillance purposes. However, the ISG audit trail is limited because it contains clearing member and executing broker's CRD numbers, but does not contain information about the beneficial owner to a trade. It also does not contain order detail information such as a complete order entry time or routing history.

COATS and the ISG equity audit trails are utilized to generate various option cross market/cross product exception reports, such as front-running and anticipatory hedges. Since the current data is unable to drill down to beneficial owner or order information, these reports are less effective and produce a large number of false positives.

(B) Costs, Benefits, and Other Economic Impacts of Audit Trail Reporting on Regulators and Market Participants

(1) Participants

There are 19 Participants of varying sizes that have established audit trail reporting requirements for NMS Securities. Of these, one is a registered securities association. The other

¹⁸⁰ Adopting Release at 45722.

18 Participants are exchanges. Fourteen of these exchanges permit quotation and transactions in NMS Securities and 12 permit transactions and quotations in Listed Options.

Participants expend resources currently to maintain and update their audit trail reporting systems. Costs for current surveillance programs as indicated by Participants responding to the Costs to Participants Study vary significantly, reflecting the various sizes of Participants: total annual costs associated with meeting current regulatory requirements are estimated to be \$6,900,000. Total annual costs for current surveillance programs for all Participants are \$147,200,000.

(2) Broker-Dealers

Broker-dealers benefit from the current regime of audit trail reporting to the extent that reporting today permits the Commission and Participants to monitor for rule compliance. Effective regulatory and compliance oversight ensures increased market integrity and supports investor confidence in participating in financial markets. Conversely, if investors believe that regulators are unable to adequately and effectively monitor activities in a complex market (through current audit trail reporting), broker-dealers bear some of the cost in the form of lower market activity.

Broker-dealers that are FINRA members must have systems and processes in place to provide FINRA with the reportable data in the required format. These systems also require resources to ensure that data quality and consistency and timeliness of reporting are maintained, and record-keeping obligations are fulfilled.¹⁸¹ Additionally, firm trading and order routing systems send orders and quotations to each exchange in the format required by such exchange. In turn, each exchange must store and convert the data for the purposes of creating internal exchange audit trails. Broker-dealers also commit staff to respond to Participant and Commission requests for additional data and related information based upon surveillance.

Broker-dealers may take varied approaches to fulfilling their regulatory reporting obligations. For instance, many broker-dealers develop internal systems for the purpose of compiling order and trading data into a reportable format. In these instances, the firms may need to centralize varied and disparate systems. Other broker-dealers typically use third parties to help them comply with their reporting obligations. These third parties may include service bureaus that provide the firms with order management systems. Firms may also contract with their clearing firms to package and submit order data files on their behalf.

Some broker-dealers that are FINRA members may be exempt from OATS reporting, or are excluded under FINRA rules from OATS requirements. Exempt firms go through a formal exemption request process through which they certify that they meet the exemption criteria which includes: (1) the member firm has total annual revenue of less than \$2,000,000; (2) the member firm and current control affiliates and associated persons of the member have not been subject within the last five years to any final disciplinary action, and within the last 10 years to any disciplinary action involving fraud; (3) the member does not conduct any clearing or carrying activities for other firms; (4) the member does not conduct any market making activities in NMS Stocks and OTC Equity Securities; and (5) the member does not execute principal

¹⁸¹ See, e.g., SEC Rules 17a-3, 17a-4; FINRA Rules 4511-13.

transactions with its customers.¹⁸² FINRA also excludes some members from the definition of a reporting member. The criteria to receive this exclusion include: (1) the member must engage in a non-discretionary order routing process where the firm immediately routes all of its orders to a single receiving reporting member; (2) the member cannot direct or maintain control over subsequent routing or execution by the receiving reporting member; (3) the receiving reporting member must record and report all information under applicable FINRA rules; and (4) the member must have a written agreement with the receiving reporting member specifying the respective functions and responsibilities of each party.¹⁸³ Approximately 660 broker-dealers are either exempt or excluded from OATS requirements, but will be required to report to the Central Repository. These broker-dealers are included in the estimate of broker-dealers currently quoting or executing trades in NMS Securities and/or Listed Options.

Additionally, the OATS rules do not require that proprietary orders generated in the normal course of market-making be reported.¹⁸⁴ While some firms have chosen to voluntarily report such orders, there may be current gaps in the audit trail.

Broker-dealers that are members of other Participants must also have systems and processes in place to provide the necessary reportable data in the required format. These systems also require resources to ensure data quality and consistency, timeliness of reporting, and record-keeping obligations.¹⁸⁵ Broker-dealers that are members of more than one Participant must maintain and manage systems that provide the relevant audit trail data to each Participant for which they have an obligation to report such data, in the manner and by the rules proscribed by each Participant, as applicable.

Upon request, broker-dealers must submit Electronic Blue Sheet (“EBS”) data to the requesting Participant by the specified due date, which is generally ten business days after receipt of the initial request. An EBS request is made by product and trade date range, with the data providing detailed information about the underlying accounts that transacted in the requested security. EBS requests can only be made for settled transactions in equity, option, or fixed income products, and they include information on allocations and executions of the requested product and may cover a time period of up to seven years from the date requested. Large Trader Reports are similar to EBS reports, except they are requested only by the Commission. Large trader requests may only be requested for NMS Securities, which may include unsettled transactions. In addition to requests being made by security and trade date range, a Large Trader request may be made by a LTID and trade date range. An LTID is an SEC identifier used to identify related entities under the same beneficial ownership structure. Broker-dealers must have systems and processes in place to provide EBS or large trader reportable data in the required format. These systems require resources to ensure that the data quality and timeliness of reporting are maintained, and record-keeping obligations are met. As with OATS, broker-dealers must commit staff to respond to requests for EBS or large trader data and may take varied approaches to fulfilling their regulatory reporting obligations.

¹⁸² See FINRA Rule 7470.

¹⁸³ See FINRA Rule 7410(o).

¹⁸⁴ See FINRA Rule 7410(j).

¹⁸⁵ See, e.g., SEC Rules 17a-3, 17a-4; FINRA Rules 4511-13.

PHLX Rule 1022 initially required members to submit specified data to PHLX for all accounts, however this rule was amended in May 2014 to more closely mirror NYSE Rule 757, ARCA Rule 6.39, and CBOE Rule 8.9, and to only require broker-dealers to report data for all of the accounts for which they engage in trading activities or which they exercise investment discretion upon request, rather than on a continuing basis. PHLX Rule 1022 was in place prior to the existence of the compliance data files from ISG (COATS and ECAT) and OCC (position). The remaining requirement for members to provide data upon request is to enable a review if required for regulatory purposes. PHLX Rule 1022 is anticipated to be retired once all CAT Reporters are submitting data to the CAT as the information would be obtainable from CAT, rather than from Industry Members.

CBOE Rule 8.9(b) requires clearing firms to submit, on a daily basis and in a manner prescribed by CBOE, every executed order entered by market makers for securities underlying options traded on CBOE or convertible into such securities or for securities traded on CBOE, as well as for opening and closing positions in all such securities held in each market maker account. To the extent that clearing firms do not report such orders and information, the market maker who entered the order is responsible for reporting the order information. These data files are commonly known as Market Maker Equity Trade (MMET) and Market Maker Stock Position (MMSTK) files. The CBOE daily reporting requirement for market makers is comparable to other option exchange reporting requirements. CBOE Rule 8.9(b) is anticipated to be amended once all CAT Reporters are submitting data to the CAT as the information would be obtainable from CAT rather than from Industry Members.

As of June 30, 2014, there were 4,406 registered broker-dealers that were members of at least one Participant. The Participants determined that, as of July 31, 2014, approximately 1,800 of these registered broker-dealers quoted or executed transactions in NMS Securities, Listed Options or OTC Equity Securities. Of these 1,800 broker-dealers, approximately 1,700 are FINRA members and are either reporting to OATS or were identified as routing firms in OATS reports submitted by other OATS reporting broker-dealers, but are otherwise excluded from the definition of an OATS reporting member or exempt from the OATS rules. In addition, there are an estimated 100 broker-dealers that reported transactions to another SRO, but that are not FINRA members. This determination was made through a review of the number of broker-dealers that transmitted order information to OATS, reported transaction information or quoted messages to a Participant for each month, over the previous 18 months. The Participants also reviewed message traffic data in the same month in the prior year and found that July 2014 was a reasonable representation of such activity.

Cost components considered in this process included technology costs (hardware / software costs), FTE costs (including, technology, operational, and compliance staffing requirements), and any outsourcing costs.¹⁸⁶ The study also contained questions related to current costs that are intended to capture the baseline costs to broker-dealers for regulatory reporting, including costs related to compliance with OATS, the EBS and Large Trader reporting, and other reporting requirements, such as NYSE Rule 410B, PHLX Rule 1022, FESC/NYSE Rule 123(e)/(f), and CBOE Rule 8.9.

¹⁸⁶ These costs are not mutually exclusive, and respondents may have included a combination of costs across all categories.

(C) Description of Costs to CAT Reporters Study Results

Of the 167 responses to the Costs to CAT Reporters Study used in the analysis of costs associated with reporting to the Central Repository, 49 were from large firms and 118 were from small firms.¹⁸⁷ Fifty-one respondents indicated that they have OATS reporting obligations and 116 respondents¹⁸⁸ stated that they do not currently have OATS reporting obligations.¹⁸⁹ Of these 51 OATS reporters, 21 were large and 30 were small broker-dealers, with one firm completing all reporting using in-house staffing, 26% using a combination of in-house staffing and outsourcing, 44% of firms outsourcing to clearing firms, and the remaining 26% outsourcing their reporting to service bureaus. Of the remaining 116 broker-dealers, self-identified as non-OATS reporters,¹⁹⁰ 28 were large and 88 were small. Figures for each respondent category have been provided for reference to support the cost analysis and include the average, median, minimum, maximum, and number of responses received equal to zero (0) or blank.¹⁹¹

In analyzing responses to the Costs to CAT Reporters Study, Participants found responses to specific questions to be outliers. However, if the overall response from that respondent was otherwise deemed to be reasonably complete, the response was included in the analysis. As a result, in some cases, this may result in averages or medians being higher or lower than may be expected. In addition, a significant number of firms, in particular large firms, indicated that their current cost for regulatory obligations is \$0. It is the Participants' understanding that this is likely due to current operational practices among broker-dealers that do not differentiate between technology and headcount costs that support business functionality and regulatory reporting.

Tables 1 and 2 describe the costs associated with current regulatory reporting requirements. Current costs for study respondents consisted of hardware / software costs, FTE costs consisting of development / maintenance, operational, and compliance staffing as well as

¹⁸⁷ Firms were requested to self-select as "small" if they would qualify under Exchange Act Rule 0-10(c) as a broker or dealer that:

(1) had total capital (net worth plus subordinated liabilities) of less than \$500,000 on the date in the prior fiscal year as of which its audited financial statements were prepared pursuant to 240.17a5(d) or, if not required to file such statements, a broker or dealer that had total capital (net worth plus subordinated liabilities) of less than \$500,000 on the last business day of the preceding fiscal year (or in the time that it has been in business, if shorter); and

(2) is not affiliated with any Person (other than a natural Person) that is not a small business or small organization as defined in this section.

¹⁸⁸ Participants recognize that 116 respondents stated that they do not currently report to OATS and this number is greater than the Participants' estimate of the total number of broker-dealers with reporting obligations to SROs other than FINRA. Participants assume that some broker-dealers who are FINRA members and currently exempt or excluded from OATS reporting requirements identified themselves as having no OATS reporting requirement. Given that these study responses provided data that could not otherwise be presumed to be incomplete or inaccurate, the Participants have chosen to include these responses in the analysis.

¹⁸⁹ The distinction between cost estimates for OATS and non-OATS reporters is being made so that Participants may assess potential differences in estimated costs across the two identified scenarios in order to capture potential differences in costs that might arise from current reporting practices.

¹⁹⁰ The distinction between cost estimates for OATS and non-OATS reporters is made so that Plan Participants may assess potential differences in estimated costs across the two identified scenarios in order to capture potential differences in costs that may arise from current reporting practices.

¹⁹¹ Some respondents provided no response to a specific question, i.e., left that response blank, while providing responses to the other questions in the study. The tables provided throughout this section provide a count of such blank responses for each question.

third party outsourcing costs. Current average (median) hardware / software costs for the 49 large firms were equal to \$310,000 (\$0) and the 118 small firms were equal to \$130,000 (\$0).

Large firms reported that they employ an average (median) of 9.56 (0.00) FTEs for OATS, EBS and other regulatory reporting requirements, while small firms employed 2.36 (0.00) FTEs for the same reporting requirements. Participants estimate the dollar costs associated with these FTEs by applying an annual expenditure of \$401,440 per FTE¹⁹² to determine cost. The resulting average (median) FTE costs were equal to \$3,800,000 (\$0) for the 49 large firms and \$950,000 (\$0) for the 118 small firms.

Third party / outsourcing costs were also varied by firm size. Average (median) third party / outsourcing costs for large firms was \$180,000 (\$0) and \$130,000 (\$0) for small firms.¹⁹³

Based on the costs associated with current regulatory reporting requirements, large firms provided an average cost of \$4,290,000, and small firms reported an average cost of \$1,210,000 for current reporting costs, with a median estimate of \$0 for both large and small firms.

Table 1: Current Costs: Large Respondents Summary (49 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$310,000	9.56	\$3,800,000	\$180,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	0.13	\$52,000	\$1,000
Maximum	\$6,000,000	190.00	\$76,300,000	\$6,000,000
Count of Zero Responses	31	25	25	36
Count of Blank Responses	0	0	0	0

¹⁹² Participants assume an annual cost per FTE of \$401,440, consistent with the rate applied by the Commission in the Adopting Release. Participants do note, however, that as part of the Costs to CAT Reporters Study, respondents were solicited to provide a cost for FTEs. Based on responses, the estimated annual cost per FTE would be \$210,000 for large firms and \$167,000 for small firms. Applying these estimates instead of the Commission's assumed annual cost would lead to dollar costs for FTEs on the order of half as large as reported here.

¹⁹³ One anonymous small firm in the sample reported a total current regulatory reporting cost of \$14 million. The Participants are not in a position to verify this number or determine whether it is due to an erroneous response (e.g., the respondent may not have recognized that the study collected responses to the cost questions in \$1,000 increments). Therefore, Participants believe median numbers might better represent the typical costs across large and small firms instead of reported averages.

Table 2: Current Costs: Small Respondents Summary (118 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$130,000	2.36	\$950,000	\$130,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	0.15	\$60,000	\$1,000
Maximum	\$14,000,000	68.00	\$27,300,000	\$6,500,000
Count of Zero Responses	96	89	89	93
Count of Blank Responses	0	0	0	0

Tables 3 to 6 describe the current regulatory costs for respondents who identified themselves as having OATS reporting obligations versus those that do not (referred to as non-OATS). For the 21 large OATS reporters, current hardware / software costs averaged \$720,000, with a median cost of \$10,000, while the 28 large non-OATS reporters reported an average hardware / software cost of \$2,600, with a median cost of \$0. For the 30 small OATS reporters, current hardware / software costs averaged \$490,000, with a median value of \$3,000, with the 88 small non-OATS reporters reporting an average hardware / software cost of \$900 and a median cost of \$0.

Large OATS reporters stated they required, on average, 17.88 FTEs, with a median value of 7.00 FTEs. Applying the FTE rate described above, this translates into an average FTE cost of \$7,200,000, and a median value of \$2,800,000. Large non-OATS reporters indicated an average FTE requirement of 3.32 and a median requirement of 0.00, translating into an average cost of \$1,300,000 and a median cost of \$0. On the other side of the spectrum, small OATS reporters stated they required, on average, 6.11 FTEs, with a median value of 3.50 FTEs. Applying the FTE rate described previously, this translates into an average FTE cost of \$2,500,000, and a median value of \$1,400,000. Small non-OATS reporters indicated average FTE requirements of 1.08 and a median requirement of 0.00, translating into an average cost of \$430,000 and median cost of \$0.

Third party / outsourcing costs for Large OATS reporters averaged \$400,000, with a median value of \$0; large non-OATS reporters indicated average third party / outsourcing costs of \$22,000, with a median value of \$0. For small OATS reporters, third party / outsourcing costs averaged \$510,000 with a median value of \$3,000; small non-OATS reporters provided average costs of \$2,900, with median costs of \$0.

Based on the cost estimates above, large OATS reporters estimated an average (median) cost equal to \$8,320,000 (\$2,810,000) while large non-OATS respondents estimated an average (median) cost equal to \$1,324,600 (\$0). Small OATS reporters estimated an average (median) cost equal to \$3,500,000 (\$1,406,000) while small non-OATS respondents estimated an average (median) cost equal to \$433,800 (\$0).

Table 3: Current Costs: Large OATS Respondents Summary (21 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$720,000	17.88	\$7,200,000	\$400,000
Median	\$10,000	7.00	\$2,800,000	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	0.13	\$52,000	\$1,000
Maximum	\$6,000,000	190.00	\$76,300,000	\$6,000,000
Count of Zero Responses	6	2	2	11
Count of Blank Responses	0	0	0	0

Table 4: Current Costs: Large Non-OATS Respondents Summary (28 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$2,600	3.32	\$1,300,000	\$22,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	1.00	\$400,000	\$60,000
Maximum	\$50,000	60.00	\$24,100,000	\$300,000
Count of Zero Responses	25	23	23	25
Count of Blank Responses	0	0	0	0

Table 5: Current Costs: Small OATS Respondents Summary (30 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$490,000	6.11	\$2,500,000	\$510,000
Median	\$3,000	3.50	\$1,400,000	\$3,000
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	0.15	\$60,000	\$1,000
Maximum	\$14,000,000	29.00	\$11,600,000	\$6,500,000
Count of Zero Responses	11	6	6	8
Count of Blank Responses	0	0	0	0

Table 6: Current Costs: Small Non-OATS Respondents Summary (88 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$900	1.08	\$430,000	\$2,900
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$3,000	3.00	\$1,200,000	\$3,000
Maximum	\$72,000	68.00	\$27,300,000	\$220,000
Count of Zero Responses	85	83	83	85
Count of Blank Responses	0	0	0	0

To understand the current costs associated with regulatory reporting and estimate the direct costs associated with the CAT NMS Plan, the Participants also conducted the Costs to Vendors Study. CAT Reporters may currently rely on third-parties to provide key services necessary to meet the reporting obligations. Smaller broker-dealers may rely wholly or in part on third-party providers for the infrastructure to manage and maintain their electronic records, including all of the data required for audit trail reporting. Larger broker-dealers and Participants may augment their own internal IT capacity and capabilities by purchasing the services of one or more third-party vendor. As a result, it is important to understand the current reporting cost as well as the likely impact of SEC Rule 613 on these vendors and to include them in the estimate of aggregate economic impacts.

The Participants received five completed responses to the Costs to Vendors Study. One of the respondents indicated that the vendor did not currently have any reporting expenses on behalf of its clients and did not expect to face any costs under the CAT. Of the remaining responses, three respondents supported more than 100 clients, and one supported between 50 and 99 clients. Two of the respondents supported up to 25 million accounts, and two supported up to 50 million accounts. Two of the respondents serviced clients with institutional and retail businesses, while the remaining two supported clients with institutional businesses only.

For equity order reporting, two respondents indicated that they process up to 1 million equity orders per day on behalf of their clients, and two respondents indicated that they process up to 2 million equity orders per day on behalf of their clients. For options order reporting, three respondents indicated that they report up to 1 million options orders per day on behalf of their clients, and one respondent indicated that it reports up to 2 million options orders per day on behalf of its clients. All four respondents indicated that they report between 3 million and 100 million OATS reportable order events¹⁹⁴ per day on behalf of their clients. Three of the four respondents submitted EBS reports for their clients, with two submitting up to 200 responses per month and one submitting up to 400 responses per month.

¹⁹⁴ See FINRA, OATS Frequently Asked Questions at D8 (last updated July 6, 1998), available at <http://www.finra.org/Industry/Compliance/MarketTransparency/OATS/FAQ/P085541>.

Reported costs for current regulatory reporting for vendors varied widely across both dollar costs and FTE requirements. Each respondent provided an FTE rate associated with their FTE requirements; therefore, FTE costs for the vendors are reported using rates provided by each respondent. Dollar costs for hardware and software ranged from \$50,000 to \$15,000,000, and FTE requirements (cost) ranged from 11 (\$2,700,000) to 92 (\$8,600,000). While the respondent with the largest number of clients reported the highest costs, costs did not always correlate uniformly with the number of clients for other firms.

(iii) Estimated Costs, Benefits, and Other Economic Impacts of the CAT NMS Plan on Affected Parties

As required by SEC Rule 613(a)(1)(vii), this section provides detailed estimated costs for creating, implementing, and maintaining the CAT, specifying (1) an estimate of the costs to Participants for establishing and maintaining the CAT; (2) an estimate of the costs to members of the Participants, initially and on an ongoing basis, for reporting the data required by the CAT NMS Plan; (3) an estimate of the costs to the Participants, initially and on an ongoing basis, for reporting the data required by the CAT NMS Plan; and (4) the Participants' proposal to fund the creation, implementation, and maintenance of the CAT, including the proposed allocation of such estimated costs among the Participants, and between the Participants and members of the Participants. The Participants are sensitive to the economic impacts of SEC Rule 613. Throughout the development of the CAT NMS Plan, the Participants have continued to focus on minimizing the costs associated with the CAT. The Participants note that the figures presented in this analysis are estimates based on research completed and currently available data and are inherently subject to uncertainties.

Through the RFP, review of proposals received, and interaction with industry, the Participants have identified the sources of the costs associated with the CAT NMS Plan. These include direct costs associated with creating, implementing and maintaining the CAT necessary to meet the requirements of the CAT NMS Plan. There are also direct costs associated with developing and adapting applicable CAT Reporter systems to meet the requirements of the CAT NMS Plan and comply with the Plan on an ongoing basis. Additionally, Participants and broker-dealers may incur direct costs associated with the retirement of redundant reporting systems, although there may also be significant savings to broker-dealers associated with retiring those systems over time.

In order to meet the responsibilities outlined in SEC Rule 613, the Participants have accrued, and will continue to accrue, direct costs associated with the development of the CAT NMS Plan. These costs include staff time contributed by each Participant to, among other things, determine the technological requirements for the Central Repository, develop the RFP, evaluate Bids received, design and collect the data necessary to evaluate costs and other economic impacts, meet with Industry Members to solicit feedback, and complete the CAT NMS Plan submitted to the Commission for consideration. The Participants estimate that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process. In addition, the Participants have incurred public relations, legal, and consulting costs in the preparation of the CAT NMS Plan. The Participants estimate the costs of these services to be \$8,800,000. These public relations, legal, and consulting costs are considered reasonably

associated with creating, implementing, and maintaining the CAT upon the Commission's adoption of the CAT NMS Plan.

Given the size and scope of the CAT initiative, estimating the costs of the creation, implementation and maintenance of the CAT is a complex task, and one that necessarily relies on input from parties not directly charged under SEC Rule 613 with the responsibility to create and file the CAT NMS Plan. In light of this, the Participants have used a multi-pronged approach to assess the potential costs of the CAT. Among other things, the Participants have evaluated the many cost-related comments received in response to the Commission's rule proposal for SEC Rule 613 and during the CAT NMS Plan development process. In addition, the Participants have considered cost analyses and considerations provided by Bidders as well as the views and related information provided by the DAG and written feedback from the SIFMA and the FIF.

The economic baseline against which the potential costs and benefits of the CAT must be compared are discussed above in Section B(7)(b)(ii). The potential impacts and estimated costs of the CAT are discussed separately below, presenting study results where applicable.

(A) Investors

Approximately 52% of Americans hold individual stocks, stock mutual funds or stocks through their retirement plan,¹⁹⁵ and the retail options industry continues to grow.¹⁹⁶

Investors benefit from the protections provided through the use of audit trail data, permitting regulators to adequately and effectively monitor activities in today's complex securities markets. In SEC Rule 613, the Commission identified several ways that the CAT would enhance the protections to investors. These include: facilitating risk-based examinations, better identification of potentially manipulative trading activity, improved processes for evaluating tips, complaints and referrals of potential misconduct made to regulators, increased efficiency of cross-market and principal order surveillance, improved analysis and reconstruction of broad-based market events, improved ability to monitor and evaluate changes to market structure, and efficiencies from a potential reduction in disparate reporting requirements and data requests.

For instance, as shown in academic literature, surveillance has been demonstrated to increase investor confidence, by mitigating manipulative behavior and increasing trading activity.¹⁹⁷ Academic literature provides support for the notion that investors associate enhanced surveillance with greater investment opportunity across a larger number of listed companies and with higher market capitalizations.¹⁹⁸ Cross-market surveillance – an opportunity expected to be improved by CAT – is likely more effective in detecting manipulative behavior than single-

¹⁹⁵ See Hibah Yousuf, *Only Half of All Americans Invested in Stocks*, CNN Money (May 9, 2014), <http://money.cnn.com/2013/05/09/investing/american-stock-ownership/> (includes Gallup Poll results).

¹⁹⁶ See, e.g., Andy Nybo, *The Retail Options Renaissance*, TABB Forum (Jan. 27, 2014), <http://tabbforum.com/opinions/the-retail-options-renaissance>.

¹⁹⁷ Cumming et al., *Global Market Surveillance*, 10(2) *Am. Law & Econ. Rev.* at 454-506 (July 24, 2008).

¹⁹⁸ See, e.g., La Porta, et al., *Legal Determinants of External Finance*, 52(3) *J. Finance* 1131-1150 (1997).

market surveillance. A more recent study provides evidence that better surveillance is associated with reduced insider trading, as it would be harder to hide such trades.¹⁹⁹

To the extent that better surveillance leads to more effective rulemaking,²⁰⁰ investors should also benefit from the improvements in market quality that might arise from such rulemaking. For example, one study shows that detailed trading rules are positively correlated with liquidity measures evidenced by lower volatility and bid-ask spreads.²⁰¹ Similarly, a separate study finds that European Union countries that have more effective rules to prevent market abuse and enhance transparency experience higher market liquidity.²⁰²

Investors may also bear the costs associated with maintaining and enhancing the current audit trail systems. In some cases, broker-dealers may pass on regulatory charges that support Participant supervision, such as with respect to Section 31 fees.²⁰³ In other cases, broker-dealers may cover some of their regulatory charges through commissions and other charges. Similarly, broker-dealers may seek to pass on to investors their costs to build and maintain the CAT, which may include their own costs and any costs passed on to them by Participants. This analysis does not measure either the likelihood of these costs being passed through to investors nor the potential dollar impact on investors. The extent to which these costs are passed on to investors depends on the materiality of the costs and the ease with which investors can substitute away from any given broker-dealer.

(B) Participants

Participants are expected to benefit from the requirements to report to the Central Repository. To the extent that the CAT enhances comparability of audit trail data – thereby enhancing order lifecycle comparability across different trading venues – Participants may better fulfill their obligations to “prevent fraudulent and manipulative acts and practices, to promote just and equitable principles of trade, to foster cooperation and coordination with persons engaged in regulating, clearing, settling, processing information with respect to, and facilitating transactions in securities” as set forth in Section 6 of the Exchange Act.

Participants would also incur direct costs associated with creating, implementing and maintaining the CAT infrastructure. The full cost associated with the build and maintenance of the CAT would be shared among Participants and Industry Members, consistent with the CAT NMS Plan. Participants would also be subject to costs associated with updating and maintaining their own systems to comply with their obligations to report to the Central Repository.

¹⁹⁹ Cumming et al., *Exchange Trading Rules, Surveillance and Insider Trading* (working paper, Oct. 29, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2101826.

²⁰⁰ Where better surveillance identifies behaviors and practices that are manipulative and harmful to the investing public more quickly and more accurately, the Commission and Participants may be able to adopt rules to stop these practices more quickly and in a more tailored fashion.

²⁰¹ Cumming et al., *Exchange Trading Rules and Stock Market Liquidity*, 99(3) *J. Financial Economics* 651-71 (Mar. 2011).

²⁰² Christensen et al., *Capital-Market Effects of Securities Regulation: Prior Conditions, Implementation, and Enforcement* (Dec. 31, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1745105.

²⁰³ Pursuant to Section 31 of the Exchange Act, Participants are required to pay transaction fees and assessments to the Commission that are designed to recover the costs related to the government’s supervision and regulation of the securities markets and securities professionals. Participants, in turn, may collect their Section 31 fees and assessments from their broker-dealer members. 15 U.S.C. § 78ee.

(1) Central Repository Build and Maintenance Costs

The CAT NMS Plan provides that the costs arising from the build and maintenance of the CAT will be collected from all CAT Reporters, which includes Participants. As described in Article XI of the CAT NMS Plan and in Section C(b)(7)(iii) below, Participants will be required to pay their allocated portion of these costs on an annual basis.

The CAT NMS Plan also contemplates that Participants may impose greater requirements on the Central Repository based on their use of information in the repository for regulatory purposes. These requirements may take the form of frequent and complex analyses of data which may likely require more resources from the Central Repository. It is critical that the Company recover its costs in a manner consistent with the principles articulated in the CAT NMS Plan, which include both the need to allocate costs in a manner consistent with the cost to operations and that the CAT NMS Plan not create significant disincentives to Participants in seeking to meet their regulatory obligations. As such, the CAT NMS Plan permits the Company to assess additional charges to Participants associated with their use of the Central Repository's data and reporting facilities as it deems necessary.

(2) Costs to Participants to Meet Reporting Requirements

The Costs to Participants Study was distributed to the Participants to collect information about the potential costs of the CAT to the Participants. The Costs to Participants Study was designed to provide insight into the current total costs associated with regulatory reporting and surveillance programs discussed above, as well as expected implementation and maintenance costs associated with reporting to and surveillance through the Central Repository.

The anticipated costs associated with the implementation of regulatory reporting to the Central Repository were estimated to be a total of \$17,900,000 across all ten Participants. Included in this cost, Participants reported a total of \$770,000 in legal and consulting costs, as well as total FTE costs of \$10,300,000 for operational, technical/development and compliance-type functions.

Maintenance costs associated with regulatory reporting to Central Repository were estimated to be a total of \$14,700,000 across all ten Participants. Included in this estimate are legal, consulting, and other costs associated with maintenance, a total of \$720,000, and \$7,300,000 to FTEs for operational, technical/development, and compliance functions regarding the maintenance of regulatory reporting associated with CAT.

The Participants were also asked to identify the costs associated with the implementation of surveillance programs within the Central Repository. The estimated total costs across all ten Participants were \$23,200,000 including estimated legal, consulting, and other costs of \$560,000. Also included in the total, Participants reported that they would allocate a total of \$17,500,000 to FTEs to operational, technical/development, and compliance staff to be engaged in the creation of surveillance programs.

The estimated total costs associated with the maintenance of surveillance programs were \$87,700,000, including \$1,000,000 for legal, consulting, and other costs. Of the total cost, the

Participants estimated that they would allocate a total of \$66,700,000 to FTEs to operational, technical/development and compliance staff.

Retirement costs for current systems were estimated to be \$310,000 across all Participants. However, Participants expect that by no longer needing to maintain these legacy systems due to adoption of the CAT, they will realize aggregate savings of \$10,600,000, which will partially offset some of the costs expected to be borne by the Participants as described further below. To the extent that the Participants are able to retire legacy systems and replace them with more efficient and cost effective technologies, they may experience additional cost savings. The Costs to Participants Study does not attempt to quantify any such additional cost savings to broker-dealers.

(C) Broker-Dealers

The CAT is expected to provide a more resilient audit trail system that may benefit broker-dealers. For instance, as noted above, more effective oversight of market activity may increase investor confidence and help expand the investment opportunity set through increased listings. Broker-dealers may benefit from increased investor confidence, provided that it results in increased trading activity. In addition, broker-dealers may experience less burden, to the extent that, data provided to the Central Repository reduces the number of direct requests by regulators for their surveillance, examination and enforcement programs. For example, after the implementation of CAT, regulators seeking to identify activity for NMS Securities at the customer account level, would access that information from the Central Repository, rather than making a Blue Sheet request.

More broadly, one benefit identified to broker-dealers of the CAT may arise from consolidating the collection and transmission of audit trail data into a uniform activity, regardless of where the quoting and trading occur. Such a consolidation may permit some broker-dealers to reduce the number of systems they operate to provide audit trail data to Participants and to retire legacy systems, at an appropriate time. Additionally, technological advances may make the operation of the new CAT Systems more efficient than those associated with the legacy systems. The Costs to CAT Reporters Study did not attempt to quantify any such cost savings to firms, and as such, the cost estimates provided here do not include consideration that such cost savings may be low.

Broker-dealers would also incur costs associated with creating, implementing and maintaining the CAT infrastructure. These costs would arise from building and maintaining the CAT and updating and maintaining their own systems to comply with their reporting obligations.

(1) CAT Build and Maintenance Costs

Broker-dealers will also be required to contribute their portion of the direct costs associated with building and maintaining the CAT, as required by SEC Rule 613 and implemented by the CAT NMS Plan. Broker-dealers with CAT reporting obligations will be required to pay their allocated portion of these costs on an annual basis, pursuant to the Funding Model.

The Funding Model acknowledges that the operating models of broker-dealers and Execution Venues are substantially different. Therefore, the Funding Model imposes different

fee structures for broker-dealers and Executions Venues. ATSs that execute orders, which are operated by registered broker-dealers pursuant to Regulation ATS, are considered Execution Venues, for purposes of the CAT NMS Plan.

(2) CAT Reporters Costs to Meeting Reporting Requirements

Responses to the Costs to CAT Reporters Study provide estimates of the direct costs to broker-dealers associated with meeting requirements to report to the Central Repository. The Costs to CAT Reporters Study contained questions related to future costs related to both the retirement of existing systems and compliance with requirements of SEC Rule 613.

Respondents were asked to evaluate the future costs under two separate approaches.²⁰⁴ For each approach, respondents were asked to estimate both for CAT implementation and maintenance: (1) the associated hardware and software costs; (2) the number of required FTEs; and (3) third-party provider costs.

a. Implementation Phase of Approach 1

Tables 7 and 8 describe the costs associated with the implementation of Approach 1. Based on the 167 study responses for the implementation of Approach 1, large firms provided an average (median) hardware / software cost of \$580,000 (\$0) and small firms provided an average (median) cost estimates of \$5,200 (\$0).

Large firms provided an average (median) FTE count of 11.00 (0.00). Multiplying these counts by the rate employed by the Commission in SEC Rule 613 as described above, FTE costs are estimated as \$4,400,000, with a median FTE cost of \$0. Small firms provided an average FTE count requirement of 1.17, with the median response provided by small respondents equal to 0.00. Participants estimate a dollar cost for the small respondent FTE requirements to be on average \$470,000, with a median estimated cost of \$0.

Participants estimate large firms would incur average (median) third party / outsourcing costs of \$72,000 (\$0) and small firms would incur an estimated average (median) cost of \$76,000 (\$0).

Total average (median) costs for Approach 1 Implementation are estimated to be \$5,052,000 (\$0) for large firms, and \$551,200 (\$0) for small firms.

²⁰⁴ The two approaches are described in detail in Appendix C, Analysis of Expected Benefits and Estimated Costs for Creating, Implementing, and Maintaining the Consolidated Audit Trail (SEC Rule 613(a)(1)(vii)).

Table 7: Approach 1 Implementation Costs: Large Respondents Summary (49 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$580,000	11.00	\$4,400,000	\$72,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	0.02	\$8,000	\$1,000
Maximum	\$10,000,000	142.00	\$57,000,000	\$2,000,000
Count of Zero Responses	28	27	27	41
Count of Blank Responses	0	0	0	0

Table 8: Approach 1 Implementation Costs: Small Respondents Summary (118 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$5,200	1.17	\$470,000	\$76,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	0.20	\$80,000	\$1,000
Maximum	\$500,000	20.00	\$8,000,000	\$8,000,000
Count of Zero Responses	95	94	94	95
Count of Blank Responses	2	0	0	1

Tables 9 and 10 describe the costs associated with the implementation of Approach 1 for large respondents with current OATS and non-OATS reporting obligations. Large OATS respondents provided an average (median) hardware / software cost estimate of \$750,000 (\$0), and large non-OATS respondents providing average (median) estimated costs of \$450,000 (\$0).

Large OATS reporters provided an average (median) FTE requirement of 14.92 (7.00), translating into estimated costs of \$6,000,000 (\$2,800,000), while large non-OATS respondents provided an average (median) FTE requirement of 8.05 (0.00), translating into an average (median) estimated cost of \$3,200,000 (\$0).

Large OATS respondents estimated an average (median) third party / outsourcing cost of \$150,000 (\$0), while large non-OATS respondents provided an average (median) estimate of \$9,500 (\$0).

Table 9: Approach 1 Implementation Costs: Large OATS Respondents Summary (21 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$750,000	14.92	\$6,000,000	\$150,000
Median	\$60,000	7.00	\$2,800,000	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	0.02	\$8,000	\$1,000
Maximum	\$7,000,000	63.00	\$25,300,000	\$2,000,000
Count of Zero Responses	6	5	5	15
Count of Blank Responses	0	0	0	0

Table 10: Approach 1 Implementation Costs: Large Non-OATS Respondents Summary (28 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$450,000	8.05	\$3,200,000	\$9,500
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	1.00	\$400,000	\$15,000
Maximum	\$10,000,000	142.00	\$57,000,000	\$250,000
Count of Zero Responses	22	22	22	26
Count of Blank Responses	0	0	0	0

Tables 11 and 12 describe the costs associated with the implementation of Approach 1 for small respondents with current OATS and non-OATS reporting obligations, small OATS respondents provided an average (median) hardware / software cost estimate of \$21,000 (\$1,000), with small non-OATS respondents providing an estimated average (median) cost of \$100 (\$0).

Small OATS reporters provided an average (median) FTE requirement of 3.51 (2.00), translating into estimated an average (median) costs of \$1,400,000 (\$800,000), while small non-OATS respondents provided an average (median) FTE requirement of 0.38 (0.00), translating into an estimated average (median) cost of \$150,000 (\$0).

Finally, small OATS respondents estimated an average (median) third party / outsourcing cost of \$300,000 (\$1,000), while small non-OATS respondents provided an average (median) estimate of \$1,100 (\$0).

Table 11: Approach 1 Implementation Costs: Small OATS Respondents Summary (30 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$21,000	3.51	\$1,400,000	\$300,000
Median	\$1,000	2.00	\$800,000	\$1,000
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	0.20	\$80,000	\$1,000
Maximum	\$500,000	20.00	\$8,000,000	\$8,000,000
Count of Zero Responses	12	12	12	12
Count of Blank Responses	1	0	0	1

Table 12: Approach 1 Implementation Costs: Small Non-OATS Respondents Summary (88 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$100	0.38	\$150,000	\$1,100
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	3.00	\$1,200,000	\$1,000
Maximum	\$5,000	15.00	\$6,000,000	\$72,000
Count of Zero Responses	83	82	82	83
Count of Blank Responses	1	0	0	0

b. Maintenance Phase of Approach 1

Tables 13 and 14 describe the costs associated with the maintenance of CAT reporting obligations for the full set of study responses under Approach 1. Based on the 167 study responses for the maintenance of Approach 1, large firms reported an average (median) hardware / software cost estimate of \$210,000 (\$0), and small firms reported an estimated cost of \$1,600 (\$0).

Large firms provided an average FTE count requirement of 8.54, with the median response provided by large firms equaled to 0.00. Multiplying these counts by the rate employed by the Commission in SEC Rule 613 as described above, FTE costs are estimated to be \$3,400,000, with a median FTE cost of \$0. Small firms provided an average FTE count requirement of 1.12, with the median response provided by small respondents equal to 0.00. Participants estimated the average dollar cost for the small respondent FTE requirement 1 to be \$450,000, and a median cost of \$0.

Large firms estimated that the average (median) third party / outsourcing cost is equal to \$52,000 (\$0) and small firms estimated average (median) costs to be equal to \$24,000 (\$0).

Total average (median) costs for Approach 1 Maintenance are estimated to be \$3,662,000 (\$0) for large firms and \$475,600 (\$0) for small firms.

Table 13: Approach 1 Maintenance Costs: Large Respondents Summary (49 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$210,000	8.54	\$3,400,000	\$52,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$2,000	0.02	\$8,000	\$1,000
Maximum	\$5,200,000	152.00	\$61,000,000	\$1,000,000
Count of Zero Responses	28	27	27	41
Count of Blank Responses	1	0	0	0

Table 14: Approach 1 Maintenance Costs: Small Respondents Summary (118 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$1,600	1.12	\$450,000	\$24,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$500	0.15	\$60,000	\$500
Maximum	\$120,000	18.00	\$7,200,000	\$1,500,000
Count of Zero Responses	96	93	93	96
Count of Blank Responses	0	0	0	0

Tables 15 and 16 show the costs associated with the maintenance of CAT reporting obligations for Approach 1 for large respondents with current OATS and non-OATS reporting obligations. Large OATS respondents provided estimated average (median) hardware / software requirements of \$380,000 (\$22,000), with large non-OATS respondents providing estimated average (median) costs of \$80,000 (\$0).

Large OATS reporters provided average (median) FTE requirements of 10.03 (4.00), translating to estimated costs of \$4,000,000 (\$1,600,000), while large non-OATS respondents provided average (median) FTE requirements of 7.41 (0.00), translating to estimated costs of \$3,000,000 (\$0).

Large OATS respondents estimated average (median) third party / outsourcing costs of \$120,000 (\$0), while large non-OATS respondents provided estimates of \$1,300 (\$0).

Table 15: Approach 1 Maintenance Costs: Large OATS Respondents Summary (21 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$380,000	10.03	\$4,000,000	\$120,000
Median	\$22,000	4.00	\$1,600,000	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$2,000	0.02	\$8,000	\$1,000
Maximum	\$5,200,000	50.00	\$20,100,000	\$1,000,000
Count of Zero Responses	6	5	5	14
Count of Blank Responses	1	0	0	0

Table 16: Approach 1 Maintenance Costs: Large Non-OATS Respondents Summary (28 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$80,000	7.41	\$3,000,000	\$1,300
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$8,000	1.00	\$400,000	\$35,000
Maximum	\$900,000	152.00	\$61,000,000	\$35,000
Count of Zero Responses	22	22	22	27
Count of Blank Responses	0	0	0	0

Tables 17 and 18 describe the costs associated with the maintenance of CAT reporting obligations for Approach 1 for small respondents with current OATS and non-OATS reporting obligations. Small OATS respondents provided estimated average (median) hardware / software requirements of \$6,000 (\$1,000), with small non-OATS respondents providing estimated average (median) costs of \$100 (\$0).

Small OATS reporters provided average (median) FTE requirements of 3.52 (2.00), translating to estimated costs of \$1,400,000 (\$800,000), while small non-OATS respondents provided average (median) FTE requirements of 0.31 (0.00), translating to estimated costs of \$120,000 (\$0).

Finally, small OATS respondents estimated average (median) third party / outsourcing costs of \$90,000 (\$1,000), while small non-OATS respondents provided estimates of \$1,100 (\$0).

Table 17: Approach 1 Maintenance Costs: Small OATS Respondents Summary (30 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$6,000	3.52	\$1,400,000	\$90,000
Median	\$1,000	2.00	\$800,000	\$1,000
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$500	0.15	\$60,000	\$500
Maximum	\$120,000	18.00	\$7,200,000	\$1,500,000
Count of Zero Responses	12	10	10	12
Count of Blank Responses	0	0	0	0

Table 18: Approach 1 Maintenance Costs: Small Non-OATS Respondents Summary (88 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$100	0.31	\$120,000	\$1,100
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	3.00	\$1,200,000	\$1,000
Maximum	\$2,000	14.00	\$5,600,000	\$72,000
Count of Zero Responses	84	83	83	84
Count of Blank Responses	0	0	0	0

c. Implementation Phase of Approach 2

Tables 19 and 20 show the costs associated with the implementation phase of Approach 2 for the full set of study responses. Based on the 167 study responses for the implementation phase of Approach 2, large firms provided average (median) hardware / software costs of \$570,000 (\$0), and small firms provided costs estimates of \$5,000 (\$0).

Large firms provided average FTE count requirements of 10.15, with the median response provided by a large firm equal to 0.00. Multiplying these counts by the rate employed by the Commission in SEC Rule 613 as described above, FTE costs can be estimated to be \$4,100,000, with a median FTE cost of \$0. Small firms provided average FTE count requirements of 1.08, with the median response provided by a small respondent equal to 0.00.

Participants estimate the dollar cost for the small respondent FTE requirements to be \$440,000, and a median cost of \$0.

Large firms estimated that average (median) third party / outsourcing costs are equal to \$68,000 (\$0) and small firms estimated average (median) costs to be equal to \$16,000 (\$0).

Total average (median) costs for Approach 2 Implementation are estimated to be \$4,738,000 (\$0) for large firms, and \$461,000 (\$0) for small firms.

Table 19: Approach 2 Implementation Costs: Large Respondents Summary (49 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$570,000	10.15	\$4,100,000	\$68,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	0.02	\$8,000	\$1,000
Maximum	\$10,000,000	116.00	\$46,600,000	\$2,000,000
Count of Zero Responses	28	28	28	41
Count of Blank Responses	0	0	0	0

Table 20: Approach 2 Implementation Costs: Small Respondents Summary (118 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$5,000	1.08	\$440,000	\$16,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	1.00	\$400,000	\$1,000
Maximum	\$500,000	20.00	\$8,000,000	\$1,000,000
Count of Zero Responses	98	96	96	97
Count of Blank Responses	1	0	0	1

Tables 21 and 22 show the costs associated with the implementation phase of Approach 2 for large respondents with current OATS and non-OATS reporting obligations. Large OATS respondents provided estimated average (median) hardware / software requirements of \$740,000 (\$60,000), with large non-OATS respondents providing estimated average (median) costs of \$450,000 (\$0).

Large OATS reporters provided average (median) FTE requirements of 14.81 (7.00), translating to estimated costs of \$5,900,000 (\$2,800,000), while large non-OATS respondents provided average (median) FTE requirements of 6.66 (0.00), translating to estimated costs of \$2,700,000 (\$0).

Finally, large OATS respondents estimated average (median) third party / outsourcing costs of \$140,000 (\$0), while large non-OATS respondents provided estimates of \$10,000 (\$0).

Table 21: Approach 2 Implementation Costs: Large OATS Respondents Summary (21 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$740,000	14.81	\$5,900,000	\$140,000
Median	\$60,000	7.00	\$2,800,000	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	0.02	\$8,000	\$1,000
Maximum	\$7,000,000	63.00	\$25,300,000	\$2,000,000
Count of Zero Responses	6	5	5	15
Count of Blank Responses	0	0	0	0

Table 22: Approach 2 Implementation Costs: Large Non-OATS Respondents Summary (28 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$450,000	6.66	\$2,700,000	\$10,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$5,000	1.00	\$400,000	\$35,000
Maximum	\$10,000,000	116.00	\$46,600,000	\$250,000
Count of Zero Responses	22	23	23	26
Count of Blank Responses	0	0	0	0

Tables 23 and 24 show the costs associated with the implementation of Approach 2 for small respondents with current OATS and non-OATS reporting obligations. Small OATS respondents provided estimated average (median) hardware / software requirements of \$20,000 (\$1,000), with small non-OATS respondents providing estimated average (median) costs of \$100 (\$0).

Small OATS reporters provided average (median) FTE requirements of 3.33 (2.00), translating to estimated costs of \$1,300,000 (\$800,000), while small non-OATS respondents

provided average (median) FTE requirements of 0.32 (0.00), translating to estimated costs of \$130,000 (\$0).

Finally, small OATS respondents estimated average (median) third party / outsourcing costs of \$60,000 (\$1,000), while small non-OATS respondents provided estimates of \$1,100 (\$0).

Table 23: Approach 2 Implementation Costs: Small OATS Respondents Summary (30 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$20,000	3.33	\$1,300,000	\$60,000
Median	\$1,000	2.00	\$800,000	\$1,000
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	1.00	\$400,000	\$1,000
Maximum	\$500,000	20.00	\$8,000,000	\$1,000,000
Count of Zero Responses	14	13	13	13
Count of Blank Responses	1	0	0	1

Table 24: Approach 2 Implementation Costs: Small Non-OATS Respondents Summary (88 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$100	0.32	\$130,000	\$1,100
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	3.00	\$1,200,000	\$1,000
Maximum	\$5,000	15.00	\$6,000,000	\$72,000
Count of Zero Responses	84	83	83	84
Count of Blank Responses	0	0	0	0

d. Maintenance Phase of Approach 2

Tables 25 and 26 show the costs associated with the maintenance of CAT reporting obligations for Approach 2 for the full set of study responses. Based on the 167 study responses for the maintenance phase of Approach 2, large firms provided average (median) hardware / software costs of \$200,000 (\$0) and small firms provided costs estimates of \$1,500 (\$0).

Large firms provided average FTE count requirements of 7.27, with the median response provided by a large firm equal to 0.00. Multiplying these counts by the rate employed by the Commission in SEC Rule 613 as described above, FTE costs can be estimated to be \$2,900,000, with a median FTE cost of \$0. Small firms provided average FTE count requirements of 1.06, with the median response provided by a small respondent equal to 0.00. Participants estimate the dollar cost for the small respondent FTE requirements to be \$430,000, with a median cost of \$0.

Large firms estimated that average (median) third party / outsourcing costs are equal to \$48,000 (\$0) and small firms estimated average (median) costs to be equal to \$10,000 (\$0).

Total average (median) costs for Approach 2 Maintenance are estimated to be \$3,148,000 (\$0) for large firms, and \$441,500 (\$0) for small firms.

Table 25: Approach 2 Maintenance Costs: Large Respondents Summary (49 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$200,000	7.27	\$2,900,000	\$48,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$2,000	0.00	\$0	\$1,000
Maximum	\$5,200,000	102.00	\$40,900,000	\$1,000,000
Count of Zero Responses	28	28	28	41
Count of Blank Responses	1	0	0	0

Table 26: Approach 2 Maintenance Costs: Small Respondents Summary (118 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$1,500	1.06	\$430,000	\$10,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$500	1.00	\$400,000	\$500
Maximum	\$100,000	18.00	\$7,000,000	\$1,000,000
Count of Zero Responses	97	94	94	93
Count of Blank Responses	2	0	0	5

Tables 27 and 28 provide the costs associated with the maintenance of CAT reporting obligations for Approach 2 for large respondents with current OATS and non-OATS reporting obligations. Large OATS respondents provided estimated average (median) hardware / software requirements of \$370,000 (\$14,000), with large non-OATS respondents providing estimated average (median) costs of \$79,000 (\$0).

Large OATS reporters provided average (median) FTE requirements of 9.79 (5.60), translating to estimated costs of \$3,900,000 (\$2,200,000), while large non-OATS respondents provided average (median) FTE requirements of 5.38 (0.00), translating to estimated costs of \$2,200,000 (\$0).

Finally, large OATS respondents estimated average (maximum) third party / outsourcing costs of \$110,000 (\$0), while large non-OATS respondents provided estimates of \$1,300 (\$0).

Table 27: Approach 2 Maintenance Costs: Large OATS Respondents Summary (21 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$370,000	9.79	\$3,900,000	\$110,000
Median	\$14,000	5.60	\$2,200,000	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$2,000	0.02	\$8,000	\$1,000
Maximum	\$5,200,000	50.00	\$20,100,000	\$1,000,000
Count of Zero Responses	6	5	5	14
Count of Blank Responses	1	0	0	0

Table 28: Approach 2 Maintenance Costs: Large Non-OATS Respondents Summary (28 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$79,000	5.38	\$2,200,000	\$1,300
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$3,000	1.00	\$400,000	\$36,000
Maximum	\$900,000	102.00	\$40,900,000	\$36,000
Count of Zero Responses	22	23	23	27
Count of Blank Responses	0	0	0	0

Tables 29 and 30 show the costs associated with the maintenance of CAT reporting obligations for Approach 2 for small respondents with current OATS and non-OATS reporting obligations. Small OATS respondents provided estimated average (median) hardware / software requirements of \$6,000 (\$500), with small non-OATS respondents providing estimated average (median) costs of \$100 (\$0).

Small OATS reporters provided average (median) FTE requirements of 3.28 (2.00), translating to estimated costs of \$1,300,000 (\$800,000), while small non-OATS respondents provided average (median) FTE requirements of 0.31 (0.00), translating to estimated costs of \$120,000 (\$0).

Finally, small OATS respondents estimated average (median) third party / outsourcing costs of \$42,000 (\$1,000), while small non-OATS respondents provided estimates of \$1,100 (\$0).

Table 29: Approach 2 Maintenance Costs: Small OATS Respondents Summary (30 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$6,000	3.28	\$1,300,000	\$42,000
Median	\$500	2.00	\$800,000	\$1,000
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$500	1.00	\$400,000	\$500
Maximum	\$120,000	18.00	\$7,000,000	\$1,000,000
Count of Zero Responses	14	11	11	12
Count of Blank Responses	1	0	0	2

Table 30: Approach 2 Maintenance Costs: Small Non-OATS Respondents Summary (88 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$100	0.31	\$120,000	\$1,100
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	3.00	\$1,200,000	\$1,000
Maximum	\$2,000	14.00	\$5,600,000	\$72,000
Count of Zero Responses	83	83	83	81
Count of Blank Responses	1	0	0	3

e. Implementation and Maintenance Costs for Approach 1 vs. Approach 2

Participants compared the estimated implementation and maintenance costs for Approach 1 and Approach 2 to determine if one solution would be more cost effective for the industry than the other. In general, respondents indicated that Approach 1 would lead to larger costs than Approach 2. Large firms estimated that it will cost approximately \$5,052,000 to implement

Approach 1, versus an estimated \$4,738,000 for Approach 2, a cost difference of \$314,000. From a maintenance perspective, large firms estimated that it would cost \$3,662,000 for Approach 1 versus \$3,148,000 for Approach 2, a cost difference of \$514,000. Small firms also indicated that Approach 1 would be more expensive to implement and maintain than Approach 2. Small firms indicated that it would cost \$551,200 to implement Approach 1 versus \$475,600 for Approach 2, indicating a cost difference of \$90,200. For the maintenance phases, small firms estimated it would cost approximately \$475,600 for Approach 1 maintenance, versus \$441,500 for Approach 2 maintenance, a cost difference of \$34,100 between approaches. However, the cost estimates between these two approaches are not statistically significant and Participants conclude that there would likely be no incremental costs associated with either Approach.²⁰⁵

f. Retirement of Systems Costs

Participants recognize that in implementing the anticipated requirements in the CAT NMS Plan, broker-dealers would likely replace some components of their current systems. The costs associated with retiring current systems were considered as part of the impacts associated with the CAT NMS Plan.

Tables 31 and 32 describe the cost associated with retirement of systems for the full set of study responses. Based on the 167 study responses for the retirement of systems large firms provided average (median) hardware / software costs of \$120,000 (\$0) and small firms provided cost estimates of \$31,000 (\$0).

Large firms provided average FTE count requirements of 6.80, with the median response provided by a large firm equal to 0.00. Multiplying these counts by the rate employed by the Commission in SEC Rule 613 as described above, FTE costs are estimated to be \$2,700,000, with a median FTE cost of \$0. Small firms provided average FTE count requirements of 1.92, with the median response provided by a small respondent of 0.00. Participants estimate the dollar cost for the small respondent FTE requirements to be an average costs of \$770,000, and a median cost of \$0.

Large firms estimated that average (median) third party / outsourcing costs to be \$10,000 (\$0) and small firms estimated average (median) costs to be \$63,000 (\$0).

Total average (median) costs for the Retirement of Systems are estimated to be \$2,830,000 (\$0) for large firms and \$864,000 (\$0) for small firms.

Table 31: Retirement of Systems Costs: Large Respondents Summary (49 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$120,000	6.80	\$2,700,000	\$10,000
Median	\$0	0.00	\$0	\$0

²⁰⁵ Participants arrive at this conclusion on the basis of a standard t-test of the hypothesis that the difference between Approach 1 and Approach 2 costs is different from zero. The t-test is unable to reject the null hypothesis (i.e., that the difference in costs between the two approaches is not distinguishable from zero) at the 0.05% level. The t-test rejects the null hypothesis for estimates of hardware / software costs, FTE costs, vendor costs, and total costs. The t-test also rejects any significant difference in estimated costs under the two approaches separately for large OATS reporters, small OATS reporters, large non-OATS reporters, and small non-OATS reporters.

Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,500	0.06	\$24,000	\$5,000
Maximum	\$4,000,000	206.00	\$82,700,000	\$360,000
Count of Zero Responses	37	32	32	44
Count of Blank Responses	0	0	0	0

Table 32: Retirement of Systems Costs: Small Respondents Summary (118 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$31,000	1.92	\$770,000	\$63,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	1.00	\$400,000	\$1,000
Maximum	\$3,500,000	68.00	\$27,300,000	\$7,000,000
Count of Zero Responses	98	100	100	97
Count of Blank Responses	0	0	0	0

Tables 33 and 34 describe the costs associated with the retirement of systems for large respondents with current OATS and non-OATS reporting obligations. Large OATS respondents provided estimated average (median) hardware / software requirements of \$270,000 (\$0), with large non-OATS respondents providing estimated average (median) costs of \$4,300 (\$0).

Large OATS reporters provided average (median) FTE requirements of 4.92 (3.10), translating to estimated costs of \$2,000,000 (\$1,200,000), while large non-OATS respondents provided average (median) FTE requirements of 8.21 (0.00), translating to estimated costs of \$3,300,000 (\$0).

Finally, large OATS respondents estimated average (median) third party / outsourcing costs of \$18,000 (\$0), while large non-OATS respondents provided estimates of \$4,800 (\$0).

Table 33: Retirement of Systems Costs: Large OATS Respondents Summary (21 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$270,000	4.92	\$2,000,000	\$18,000
Median	\$0	3.10	\$1,200,000	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,500	0.06	\$24,000	\$5,000
Maximum	\$4,000,000	33.00	\$13,200,000	\$360,000

Count of Zero Responses	11	6	6	18
Count of Blank Responses	0	0	0	0

Table 34: Retirement of Systems Costs: Large Non-OATS Respondents Summary (28 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$4,300	8.21	\$3,300,000	\$4,800
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$10,000	24.00	\$9,600,000	\$60,000
Maximum	\$110,000	206.00	\$82,700,000	\$75,000
Count of Zero Responses	26	26	26	26
Count of Blank Responses	0	0	0	0

Tables 35 and 36 show the costs associated with the retirement of systems for small respondents with current OATS and non-OATS reporting obligations for the full set of study respondents. Small OATS respondents provided estimated average (median) hardware / software requirements of \$3,600 (\$500), with small non-OATS respondents providing estimated average (median) costs of \$40,000 (\$0).

Small OATS reporters provided average (median) FTE requirements of 4.60 (0.00), translating to estimated costs of \$1,800,000 (\$0), while small non-OATS respondents provided average (median) FTE requirements of 1.00 (0.00), translating to estimated costs of \$400,000 (\$0).

Finally, small OATS respondents estimated average (median) third party / outsourcing costs of \$240,000 (\$1,500), while small non-OATS respondents provided estimates of \$3,000 (\$0).

Table 35: Retirement of Systems Costs: Small OATS Respondents Summary (30 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$3,600	4.60	\$1,800,000	\$240,000
Median	\$500	0.00	\$0	\$1,500
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	1.00	\$400,000	\$1,000
Maximum	\$39,000	30.00	\$12,000,000	\$7,000,000

Count of Zero Responses	15	16	16	13
Count of Blank Responses	0	0	0	0

Table 36: Retirement of Systems Costs: Small Non-OATS Respondents Summary (88 Firms)				
	Hardware / Software	FTE Counts	FTE Costs	Third Party / Outsourcing
Average	\$40,000	1.00	\$400,000	\$3,000
Median	\$0	0.00	\$0	\$0
Minimum	\$0	0.00	\$0	\$0
Minimum (non-zero)	\$1,000	3.00	\$1,200,000	\$3,000
Maximum	\$3,500,000	68.00	\$27,300,000	\$220,000
Count of Zero Responses	83	84	84	84
Count of Blank Responses	0	0	0	0

In comparing the two approaches and their costs to the current costs incurred by a broker-dealer for current regulatory reporting, respondents have indicated that they estimate both Approach 1 and Approach 2 to be less expensive than current regulatory reporting requirements. Overall, firms estimated that current costs would be \$4,290,000 for large firms versus \$1,210,000 for small firms, while maintenance costs of Approach 1 for large firms would cost \$3,662,000 and \$475,600 for small firms, indicating cost savings of \$628,000 for large firms and cost savings of \$734,400 for small firms. For maintenance costs related to Approach 2, large firms indicated costs of \$3,148,000 with an expected savings of \$1,142,000 while small firms estimated maintenance costs of \$441,500 with expected savings of \$768,500.

Although there are differences in the current and anticipated maintenance costs discussed above, the Participants conclude that there would be no statistical difference in costs associated with the maintenance of the CAT, compared to maintenance costs for existing regulatory reporting requirements. Participants arrive at this conclusion on the basis of a standard t-test of the hypothesis that the difference in costs to broker-dealers between Approach 1 and Approach 2 is different from zero. The t-test is unable to reject the null hypothesis (i.e., that the difference in costs between the two approaches is not distinguishable from zero) at the 0.05% level separately for estimates of hardware / software costs, FTE costs, vendor costs, and total costs across large OATS reporters, small OATS reporters, large non-OATS reporters, and small non-OATS reporters.

g. Industry Feedback on Costs to CAT Reporters Study

Participants' understanding of broker-dealer costs has been enhanced through frequent dialogue with Industry Members. The DAG has largely provided written feedback on costs

through the industry association members. In March 2013, SIFMA provided feedback on industry costs in its Consolidated Audit Trail White Paper.²⁰⁶ The association group stated that the industry is likely to face costs related to upgrading the regulatory reporting infrastructure. SIFMA highlighted that additional costs borne will be distributed across the front office, middle office, customer master data, compliance and risk and data management. Additionally, in February 2012, the FIF conducted a study to assess the costs associated with the implementation of OATS.²⁰⁷ In a summary of the study, FIF highlights that “future estimates of cost should consider the FIF cost model, most importantly the effort expended on business analysis and testing as part of the implementation effort.” One key view presented by the DAG was that retiring legacy systems will likely reduce costs to the industry, given their redundancies with the CAT. However, the FIF highlighted that existing timelines do not take into account costs associated with concurrent reporting for existing regulatory reporting and new regulatory requirements associated with the Central Repository.²⁰⁸ Additional detail around the plan to retire existing regulatory reports can be found in Appendix C, Section C.9.

(D) Vendors

The Costs to Vendors Study requested information regarding various third party service provider and vendor costs to comply with the requirements of SEC Rule 613.

Based upon the responses to the Costs to Vendors Study, the expected dollar costs for implementation and maintenance of the CAT are largely the same for both approaches, and ranged widely between \$0 and \$20,000,000 for implementation and \$50,000 and \$6,000,000 for ongoing maintenance. One firm did indicate that Approach 1 would have substantially higher maintenance costs (\$400,000 for Approach 1 versus \$50,000 for Approach 2). For headcount and costs associated with implementation and maintenance of the CAT, all respondents indicated that Approach 1 would require more FTE resources (costs) to implement (ranging from 14 (\$9,600,000) to 170 (\$35,900,000) FTEs for Approach 1 and from 4 (\$2,700,000) to 45 (\$24,200,000) for Approach 2), while Approach 2 would require more FTE resources to maintain (ranging from 4.5 (\$4,100,000) to 35 (\$9,300,000) for Approach 1 and from 2 (\$2,500,000) to 56 (\$11,200,000) for Approach 2). As with current regulatory reporting costs, the firm with the largest number of clients reported the highest costs, but number of clients did not always correlate uniformly with higher expected costs for the other firms.

Three of the four respondents to the vendor study indicated that they would incur costs to retire current regulatory reporting systems, with costs ranging from \$500,000 to \$5,000,000, with the firm with the highest expected retirement costs also having the highest current reporting costs. FTE requirements ranged from 1.5 (\$250,000) to 23 (\$7,200,000) FTEs.

Under Approach 1, two respondents expected ongoing maintenance to cost less than the maintenance of current regulatory reporting requirements, with the remaining two expecting higher costs. Under Approach 2, two respondents expected ongoing maintenance to cost less

²⁰⁶ See SIFMA Recommendations.

²⁰⁷ See SEC Memorandum to File No. S7-11-10, Re: Staff Meeting with the Financial Information Forum (Feb. 29, 2012), available at <http://www.sec.gov/comments/s7-11-10/s71110-112.pdf>.

²⁰⁸ See FIF, Comment Letter Re: Consolidated Audit Trail National Market System Plan Submission (Nov. 19, 2014), available at <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p601972.pdf>.

than the maintenance of current regulatory reporting requirements, one expected costs to be the same, and the final firm expected costs to be greater. All firms expected headcount associated with ongoing maintenance of the CAT to be less than under current reporting requirements.

(E) Issuers

Issuers also benefit from an effective regulatory regime supported by a reliable and complete audit trail. Specifically, issuers may benefit from enhanced investor confidence associated with better and more efficient oversight. The increase in investor confidence may draw more investors into the market, relative to other investment opportunities that do not provide the same protections. Increasing the pool of investors willing to invest in a primary offering may manifest itself in a lower cost of capital. Increased investor participation in secondary trading may also increase demand in the primary market, as the increased interest would be associated with greater efficiency in pricing and lower adverse selection costs. To the extent that the issuers do not have independent reporting obligations to the Central Repository (i.e., they are not otherwise CAT Reporters), they are not anticipated to incur direct costs associated with the CAT NMS Plan.

(F) Indirect Costs

The Participants recognize that in addition to direct costs, there may be indirect costs borne by parties as a result of the implementation of the CAT NMS Plan. As discussed further below, it is not possible for the Participants to quantify these costs, and as such, we present a qualitative discussion.

The Participants have identified at least three distinct ways for indirect costs to arise as a result of the implementation of the CAT NMS Plan. First, all CAT Reporters are subject to direct fees to pay for the creation, implementation, and maintenance of the CAT along with other direct costs to meet CAT NMS Plan obligations. CAT Reporters may endeavor to shift these fees and other costs to their clients. Where CAT Reporters can do so successfully, the clients bear an indirect cost arising from the CAT NMS Plan. Second, to the extent that the Commission and the Participants amend their surveillance programs in the presence of the Central Repository, the broker-dealers may incur costs to adjust their internal compliance programs. And third, as described more fully in Appendix C, Analysis of the Impact on Competition, Efficiency and Capital Formation, broker-dealer competition may be impacted if the direct and indirect costs associated with meeting the CAT NMS Plan's requirements materially impact the provision of their services to the public. Such a reduction in the provision of these services may impose an indirect cost on the public as well.

The Participants considered the potential for CAT Reporters to shift fees and other costs associated with the CAT NMS Plan. Participants may charge their members to cover the CAT NMS Plan costs either explicitly or subsume those costs in other fees or assessments. Broker-dealers may charge their clients for their own costs, whether incurred directly or indirectly, either through explicit fees associated with CAT or through their existing fee structures. This analysis does not measure either the likelihood of costs being passed from the Participant to the broker-dealers or from the broker-dealers to their clients, or the potential associated dollar impacts. The extent to which these costs may be passed on to clients is related to alternative sources of

revenue available to the CAT Reporters, the materiality of those costs, and the ease with which clients can substitute away from any given Participant or broker-dealer. Participants note, however, that Participants and broker-dealers may currently have incentives and opportunity to shift regulatory compliance costs to their customers and that nothing in the CAT NMS Plan alters those incentives or the likelihood of those costs being passed on.

In addition, indirect costs to broker-dealers may arise as a result of the implementation of the CAT NMS Plan. First, broker-dealers may incur additional costs related to training and professional development, to equip the staff with the necessary knowledge necessary for compliance with the SEC Rule 613. Broker-dealers were specifically asked to consider these costs as part of their study response. Second, the enhanced and standardized data to be captured by the Central Repository is anticipated to increase the effectiveness of surveillance by regulators, which may impact broker-dealer compliance programs.

(iv) Estimate of Aggregate Direct Costs and the Allocation of Costs across CAT Reporters

(A) Estimate of Aggregate Costs

In order to create the regulatory data infrastructure required by SEC Rule 613, this Plan proposes to build and maintain the CAT, along with resources necessary to generate regulatory reports and related analysis. CAT Reporters, including Participants and broker-dealers engaging in trading and quoting activities in Eligible Securities, will be jointly responsible for providing the capital to build and maintain the CAT. Costs eligible to be allocated jointly include any associated liabilities accrued during the planning and building phases of the project that are directly attributable to the CAT NMS Plan, for example, legal and consulting fees, and will be allocated according to the funding model described in Article XI of the CAT NMS Plan.

In order to calculate to the implementation and annual maintenance costs of the CAT, the Participants considered the relevant cost factors for the following entities: Plan Processor, Participants, broker-dealers (large and small) and vendors. All implementation costs reflected below are in dollar costs for the year they are expected to be incurred, while all maintenance costs are estimated for the fifth year after the approval of the CAT NMS Plan, when all CAT Reporters are expected to be live.

(1) Plan Processor

Implementation Costs. For implementation costs associated with the Plan Processor, the Participants reviewed the build costs received from the Shortlisted Bidders and identified the high and low costs to use as a component of the overall industry cost. The lowest cost received was \$30,000,000 and the highest estimate received was \$91,600,000.

Maintenance Costs. For maintenance costs associated with the Plan Processor, the Participants also reviewed the cost schedules received from the Shortlisted Bidders to build the range. To define the range of maintenance costs, the Participants reviewed the peak year maintenance costs from the Shortlisted Bidders. In addition to the costs received from the Shortlisted Bidders associated with the maintenance of operating and running the CAT, the Participants also included a yearly technical upgrade estimate to conservatively take into account

changes in technology that may take place during the maintenance of the CAT. These additional costs begin at approximately 20% in year one, and slowly decrease to 5% during year five of operation. As such, the annual maintenance costs are estimated to range from \$35,200,000 to \$134,900,000.

Retirement of Systems Costs. The Plan Processor is not expected to incur costs related to the retirement of systems.

(2) Participants

Upon review of the requirements associated with Approach 1 and Approach 2, the Participants identified that they do not favor one approach over the other.

Implementation Costs. To estimate implementation costs for the Participants, the Participants used the aggregated results from the Costs to Participants Study. Based on the responses received from the Participants, the implementation of regulatory reporting is expected to cost \$17,900,000 and the implementation of surveillance functions is estimated to cost \$23,200,000.

Maintenance Costs. To estimate the maintenance costs for the Participants, the Participants reviewed the results from the Costs to Participants Study for regulatory reporting and surveillance costs. The Participants estimated that annual aggregate regulatory reporting costs would be equal to \$14,700,000 and that annual aggregate surveillance maintenance costs would cost \$87,700,000.

Retirement of Systems Costs. To estimate the costs related to the retirement of systems for the Participants, the Participants reviewed the results from the Costs to Participants Study for retirement of systems costs. The Participants estimated that costs associated with retirement of systems would be equal to \$310,000.

(3) Broker-Dealers

Implementation and maintenance costs related to the CAT for broker-dealers were extrapolated from the results of the Costs to CAT Reporters Study. As described above, the Participants believe there to be approximately 1,800 broker-dealers that would be CAT Reporters. Of the 167 respondents to the Costs to CAT Reporters Study, 49 were large firms, and 118 were small firms, indicating a large to small firm ratio in the overall population of 29% to 71%. Applying this ratio to the total population of 1,800 broker-dealers, results in 522 large firms and 1,278 small firms. In comparing the costs between the two approaches, the Participants have identified that Approach 1 is more expensive than the Approach 2, which causes Approach 1 to form the upper bound of the broker-dealer cost range, and Approach 2 to form the lower bound of the broker-dealer cost range.

Implementation Costs. For Approach 1, large firm respondents estimated that implementation costs would be equal to \$5,052,000 per firm, for a total estimated implementation cost of approximately \$2.6 billion. Small firm respondents estimated that implementation costs for Approach 1 would be equal to \$551,200 per firm, for a total estimated

implementation cost of \$740 million.²⁰⁹ For Approach 2, large firm respondents estimated that implementation costs would be equal to \$4,738,000 per firm, for a total estimated implementation cost of approximately \$2.5 billion, while small firms estimated implementation costs for Approach 2 to be equal to \$461,000 per firm, for a total cost of \$619 million.²¹⁰ This results in a cost range of \$2.5 billion to \$2.6 billion for large firms, and a cost range of \$619 million to \$740 million for small firms for the implementation of the CAT.

Maintenance Costs. For Approach 1, large firm respondents estimated that maintenance costs would be equal to \$3,662,000 per firm per year, for a total estimated annual maintenance cost of approximately \$2.3 billion.²¹¹ Small firm respondents estimated that maintenance costs for Approach 1 would be equal to \$475,600 per firm per year, for a total estimated annual maintenance cost of approximately \$739 million.²¹² For Approach 2, large firm respondents estimated that maintenance costs would be equal to \$3,148,000 per firm per year, for a total estimated annual maintenance cost of approximately \$2.0 billion,²¹³ while small firms estimated maintenance costs for Approach 2 to be equal to \$441,500 per firm per year, for a total annual cost of approximately \$686 million.²¹⁴ This implies an annual cost range of approximately \$2.0 billion to \$2.3 billion for large firms, and an annual cost range of approximately \$686 million to \$739 million for small firms for maintenance of reporting to the Central Repository. These maintenance costs are discrete costs for the maintenance of CAT reporting, and are not intended to show incremental costs against current regulatory reporting requirements. Based on the Costs to CAT Reporters Study, Participants estimate these incremental costs to be negligible.

Retirement of Systems Costs. To estimate the costs related to the retirement of systems for the broker dealers, the Participants reviewed the results from the Costs to CAT Reporters Study for retirement of systems costs. Large firm respondents estimated costs to be equal to \$2,830,000, for a total retirement of systems cost equal to approximately \$1.47 billion. Small firms estimated that costs related to the retirement of systems would cost \$864,000, for a total retirement of systems cost of approximately \$1.10 billion.

(4) Vendors

Implementation Costs. For implementation costs associated with Vendors, the Participants reviewed the aggregate build costs received from the Costs to Vendors Study and identified that Approach 1 would cost \$118,200,000 to implement, while it would cost \$51,600,000 to implement Approach 2.²¹⁵

²⁰⁹ Small firm total estimated implementation costs include a compound annual growth rate of 5% to account for increases in labor and operational costs over time. The rate was applied for one year, from the beginning of CAT reporting in year 1 through the expected incurring of build costs by small firms in the year prior to the start of their reporting (i.e., year 2). Because large firms report a year earlier than small firms and would incur most implementation costs in year 1, a similar rate has not been applied to their implementation costs.

²¹⁰ *Id.*

²¹¹ Large and small firm total estimated maintenance costs are estimated in year 5 to account for a steady state of reporting, and include a compound annual growth rate of 5% to account for increases in labor and operational costs over time. The rate was applied for four years, from the beginning of CAT reporting in year 1 through year 5.

²¹² *Id.*

²¹³ *Id.*

²¹⁴ *Id.*

²¹⁵ Vendor cost estimates assume an annual cost per FTE of \$401,440, consistent with the rate applied by the Commission in the Adopting Release.

Maintenance Costs. For maintenance costs associated with Vendors, the Participants also reviewed the cost schedules received from the Costs to Vendors Study. Vendors indicated an aggregate estimated annual cost of \$38,600,000 for maintenance of Approach 1, and annual estimated maintenance costs of \$48,700,000 for Approach 2.²¹⁶

Retirement of Systems Costs. Vendors indicated an aggregate cost of \$21,300,000 for the retirement of existing regulatory reporting systems.

(5) Total Aggregate Costs

Based on the analysis of responses to the studies described above, and cost estimates provided by the Shortlisted Bidders, the Participants estimate the initial aggregate cost to the industry related to building and implementing the CAT would range from \$3.2 billion to \$3.6 billion. Estimated annual aggregate costs for the maintenance and enhancement of the CAT would range from \$2.8 billion and \$3.4 billion. Additionally, costs to retire existing systems would be approximately \$2.6 billion.

(B) Impacts of Not Receiving Requested Exemptions

On January 30, 2015, the Participants submitted a letter to request that the Commission grant exemptions, pursuant to its authority under Section 36 of the Exchange Act, from the requirement to submit a national market system plan that meets certain reporting requirements specified in SEC Rule 613(c) and (d). Specifically, the Participants requested exemptive relief related to: (1) options market maker quotes; (2) Customer-IDs; (3) CAT-Reporter-IDs; (4) linking executions to specific subaccount allocations on Allocation Reports; and (5) time stamp granularity. On September 2, 2015, the Participants supplemented their request with a supplemental request, clarifying its original requested exemption from the requirement in Rule 613(c)(7)(viii)(B) (including, in some instances, requesting an exemption from the requirement to provide an account number, account type and date account opened under Rule 613(c)(7)(viii)(B)).

First, SEC Rule 613(c)(7) requires both options market makers and the options exchanges to record and report the details of options market maker quotes received by the options exchanges to the Central Repository. The Participants requested that the Commission provide the Participants with an exemption so that only options exchanges would record and report details for each options market maker quote and related Reportable Event to the Central Repository, while options market makers would be relieved of their obligation to record and report their quotes and related Reportable Events to the Central Repository. The Participants estimated that having both parties report options market maker quotes to the CAT would impose significant costs on the Plan Processor due to increased data storage and technical infrastructure, and on the options market makers due to a higher volume of reporting obligations. The Participants estimated that having both parties report options market maker quotes to the CAT would increase the size of data submitted to the CAT by approximately 18 billion records each day. Bidders estimated that requiring dual reporting of options market maker quotes would, over

²¹⁶ The total estimated vendor maintenance costs include a compound annual growth rate of 5% to account for increases in labor and operational costs over time. The rate was applied for four years, from the beginning of broker-dealer CAT reporting in year one through year five.

a five year period, lead to additional costs of between \$2 million and \$16 million for data storage and technical infrastructure for the Plan Processor. In addition, according to the results of a cost study conducted by three industry associations,²¹⁷ the cost to options market makers to meet their quote reporting obligations ranges from \$307 million to \$382 million over a five year period.

Second, Rule 613(c)(7) requires each CAT Reporter to record and report “Customer-ID(s) for each customer” when reporting order receipt or origination information to the Central Repository. The Commission noted that including a unique customer identifier could enhance the efficiency of surveillance and regulatory oversight. The Participants, however, favor the Customer Information Approach, that would require broker-dealers to provide detailed account and Customer information to the CAT, and have the Plan Processor correlate the Customer information across broker-dealers, assign a unique Customer identifier to each Customer and use that unique Customer identifier consistently across all CAT Data. The Participants believe that the Customer-ID approach imposes a significant cost burden on market participants and on the Plan Processor. According to cost estimates provided by the DAG,²¹⁸ the cost for the top 250 CAT reporters to implement the Customer-ID as required in SEC Rule 613 would be at least \$195 million. The Participants believe that this cost estimate is conservative, since it only represents the cost estimate for 11% of the total broker-dealers that are expected to be CAT Reporters.

Third, SEC Rule 613(c)(7) requires that a CAT-Reporter-ID be reported to the Central Repository for each order and Reportable Event, so that regulators can determine which market participant took action with respect to an order at each Reportable Event. The Participants, however, have proposed to leverage existing business practices and identifiers (“Existing Identifier Approach”), rather than requiring new identifiers be established, as the former is deemed more efficient and cost-effective in implementing the CAT-Reporter-ID. The Participants believe that the CAT-Reporter-ID approach would impose a material cost burden on broker-dealers and Participants, as compared to the Existing Identifier Approach, since it would require major changes to broker-dealer systems. According to cost estimates provided by the DAG, the cost for the 250 largest CAT Reporters to implement the CAT-Reporter-ID as required by SEC Rule 613 would be \$78 million.

Fourth, Rule 613(c)(7) requires each CAT Reporter to record and report the “the account number for any subaccounts to which the execution is allocated (in whole or part)” if an order is executed. The Participants acknowledge that this information is useful to regulators to fulfill their obligations to protect investors. However, the Participants estimate that meeting the obligations of the Rule would be unduly burdensome and costly to achieve given the existing allocation practices. As an alternative, the Participants proposed that allocations will be reported by CAT Reporters via a tool described as an Allocation Report. To create linkages from the order execution to the allocation process by means of an order identifier, the broker-dealers would be required to perform extensive re-engineering of their front, middle, and back office

²¹⁷ Cost Survey Report on CAT Reporting of Options Quotes by Market Makers, conducted by the Financial Information Forum, Securities Industry and Financial Markets Association and Securities Traders Association (Nov. 5, 2013); available at <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p601771.pdf>.

²¹⁸ Cost estimates provided by the DAG on topics where the Participants have requested exemptive relief can be found at: <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p602494.pdf>

systems, and thus incur significant costs. According to cost estimates provided by the DAG, the cost for the 250 largest CAT Reporters to link allocations to executions would be \$525 million.

Finally, Rule 613(d) requires the recording and reporting of the time of certain Reportable Events to the Central Repository with time stamps at least to the millisecond. The Participants understand that time stamp granularity to the millisecond reflects current industry standards with respect to electronically-processed events in the order lifecycle. However, due to the lack of precision, the industry practice with respect to manual orders is to capture manual time stamps with granularity at the level of one second. The Participants believe that compliance with the time stamp granularity requirements of the Plan for Manual Order Events would result in added costs to the industry as there may be a need to upgrade databases, internal messaging applications/ protocols, data warehouses, and reporting applications to enable the reporting of such time stamps to the Central Repository. The Participants estimate that the total minimum cost to the industry to comply with a singular time stamp requirement for all CAT reporting would be approximately \$10.5 million. This estimate is based on a current cost of \$1,050 per manual timestamp clock which stamps to the second, with approximately 10,000 clocks requiring replacement across the industry. Upgrading this to millisecond granularity would likely add to the cost to the industry.

(C) Allocation of Costs Across CAT Reporters

Article XI of the CAT NMS Plan provides the process for determining the funding of the Company. In general, the Participants' approach to funding of the Company is: (A) to operate the Company on a break-even basis, which means having fees imposed and collected that cover the Company's costs and an appropriate reserve; and (B) to establish a fee structure that is equitable based on funding principles.²¹⁹ Such equitable funding principles include: (1) to create transparent, predictable revenue streams aligned with anticipated costs; (2) to allocate costs among Participants and Industry Members taking into account the timeline for implementation of the CAT and the distinctions in the securities trading operations of Participants and Industry Members and their impact on the Company's resources and operations; (3) to establish a tiered fee structure in which there is general comparability in the level of fees charged to CAT Reporters with the most CAT-related activity as measured by market share for Execution Venues, including ATSS, and by message traffic for non-ATS activities of Industry Members, where, for these comparability purposes, the tiered fee structure takes into consideration affiliations between or among CAT Reporters, whether Execution Venues and/or Industry Members; (4) to provide ease of administrative functions; (5) to avoid disincentives such as burdens on competition and reduction in market quality; and (6) to build financial stability for the Company as a going concern.²²⁰

Based on these principles, the Operating Committee will establish the Company's funding, which is expected to arise primarily from fees charged to Participants and Industry Members. The Participants have sought input from the DAG as to the specific types of fees. Accordingly, the Participants propose to include the following fee types: (i) fixed fees payable by each Execution Venue that trades NMS Securities and OTC Equity Securities based on its market share (establishing two to five tiers of fixed fees); (ii) fixed fees payable by each

²¹⁹ See Section 11.2 of the CAT NMS Plan.

²²⁰ See *id.*

Execution Venue that trades Listed Options (as defined in Rule 600(b)(35) of Regulation NMS) based on its market share (establishing two to five tiers of fixed fees); (iii) fixed fees payable by each Industry Member based on message traffic generated by such Industry Member (for the avoidance of doubt, the fixed fees payable by Industry Members pursuant to this paragraph shall, in addition to any other applicable message traffic, include message traffic generated by: (i) an ATS that does not execute orders that is sponsored by such Industry Member; (ii) routing orders to and from any ATS sponsored by such Industry Member); and (iii) ancillary fees (e.g., fees for late or inaccurate reporting, corrections, and access and use of the CAT for regulatory and oversight purposes).²²¹

The Operating Committee will use two different criteria to establish fees – market share²²² for Execution Venues, including ATSs, and message traffic for Industry Members’ non-ATS activities – due to the fundamental differences between the two types of entities. While there are multiple factors that contribute to the cost of building, maintaining and using the CAT, Bidders stated during workshops and in response to specific questions posed by the Participants that processing and storage of incoming message traffic is one of the most significant cost drivers for the CAT. Thus, the Participants believe that basing fees on message traffic for non-Execution Venue Industry Members is consistent with an equitable allocation of the costs of the CAT. On the other hand, message traffic would not provide the same degree of differentiation between Participants that it does for Industry Members. Because the majority of message traffic at the Participants consists of quotations, and Participants usually disseminate quotations in all instruments they trade, regardless of execution volume, Execution Venues that are Participants generally disseminate similar amounts of message traffic. In contrast, execution volume more accurately delineates the different levels of trading activity of the Participants. For these reasons, the Participants believe that market share is the appropriate metric to use in establishing fees for Participants. Moreover, given the similarity between the activity of exchange Participants and ATSs, both of which meet the definition of an “exchange” as set forth in the Exchange Act, the Participants believe that ATSs should be treated in the same manner as the exchange Participants for the purposes of determining the level of fees associated with the CAT.

Costs are allocated across the different types of CAT Reporters (broker-dealers, Execution Venues) on a tiered basis, in order to equitably allocate costs to those CAT Reporters that contribute more to the costs of creating, implementing and maintaining the CAT. The fees to be assessed at each tier are calculated so as to recoup a proportion of costs appropriate to the message traffic from firms in each tier. Therefore, larger broker-dealers, generating the majority of message traffic, will be in the higher tiers, and therefore be charged a higher fee. Smaller broker-dealers with low levels of message traffic will be in lower tiers and will be assessed a minimal fee for the CAT. The Participants estimate that up to 75% of broker-dealers will be in the lower tiers of the Funding Model.

All fees under Article XI charged directly to Participants and indirectly to Industry Members will be reviewed by the Operating Committee at least annually.²²³ All proposed fees to be charged to Industry Members by Participants will be filed with the Commission pursuant to

²²¹ See Section 11.3 (a)-(c) of the CAT NMS Plan.

²²² Market share for Execution Venues is defined as the total trade volume executed on an individual Execution Venue as a percentage of total trades executed across all Venues.

²²³ See Section 11.3(d) of the CAT NMS Plan.

Section 19(b) of the Exchange Act.²²⁴ In addition, all disputes with respect to the fees the Company charges Participants will be resolved by the Operating Committee or a Subcommittee designated by the Operating Committee, subject to the right of Participants to seek redress from the Commission pursuant to SEC Rule 608 or in any other appropriate forum.²²⁵ The Participants will adopt rules requiring that disputes with respect to fees charged to Industry Members will be resolved by the Operating Committee or a Subcommittee, subject to the right of any Industry Member to seek redress from the SEC pursuant to SEC Rule 608 or in any other appropriate forum.²²⁶

The CAT NMS Plan contemplates that the Plan Processor will be responsible for developing and executing administrative processes and procedures to effectuate the smooth functioning of the CAT, consistent with the principles articulated in Article XI. These processes and procedures would include, but are not limited to, establishing budget, notice, billing and collection cycles that provide transparency, predictability and ease of administrative functions to CAT reporters. Criteria and schedules for ancillary fees that might be collected pursuant to Article XI are also anticipated to be published by the Operating Committee.

In articulating the funding principles of the CAT NMS Plan, Participants have established the need for the CAT NMS Plan to, among other things: (1) create transparent, predictable revenue streams for the Company that are aligned with the anticipated costs to build, operate, and administer the CAT and the other costs of the Company; and (2) provide for ease of billing and other administrative functions. The funding principles articulated in Article XI should also inform the policies and procedures adopted by the Operating Committee in executing the associated functions. To that end, to promote fairness and transparency with respect to fees, the Participants expect that the Operating Committee will adopt policies, procedures, and practices around budgeting, assignment of tiers, adjudicating disputes, billing, and collection of fees that provide appropriate transparency to all CAT Reporters. Participants expect that policies or procedures adopted to implement the administration of fee allocation and collection among CAT Reporters would be subject to comment by impacted parties before adoption.

(v) Alternatives Considered

(A) Technical Solution

SEC Rule 613(a)(1)(xii) directs Participants to discuss reasonable alternative approaches to creating, implementing and maintaining the CAT. As part of the development of the CAT NMS Plan, the Participants considered a variety of alternatives with respect to technical and user support considerations. The technical considerations include: primary storage, data ingestion format, development process, quality assurance staffing and user support staffing. The analysis presented in Appendix C, D.12, below, describes alternative approaches considered for each technical consideration and the ultimate choice of the CAT NMS Plan based on factors that consider feasibility, cost and efficiency.

²²⁴ See Section 11.1(b) of the CAT NMS Plan.

²²⁵ See Section 4.1 and Section 11.5 of the CAT NMS Plan.

²²⁶ See *id.*

In addition, the questions included in the Costs to CAT Reporters Study described above permitted the Participants to evaluate cost considerations to Industry Members associated with two different technical formats for reporting audit trail data to the Central Repository. One approach might permit broker-dealers to submit information data to the Central Repository using their choice among existing industry protocols, such as FIX. The second approach provided a scenario where CAT Reporters would submit relevant data to the Central Repository using a defined or specified format, such as an augmented version of OATS.

(B) Funding Model

As discussed above, Article XI of the CAT NMS Plan sets forth the provisions for establishing the funding of the Company and recovering the costs of operating the CAT. The Participants recognize that there are a number of different approaches to funding the CAT and have considered a variety of different funding and cost allocation models. Each model has its potential advantages and disadvantages. For example, a structure in which all CAT Reporters are charged a fixed fee regardless of reportable activity would provide CAT Reporters greater certainty regarding their fee obligations, but may place undue burden on small CAT Reporters. A variable fee structure focused on specific reportable information may make it easier for Industry Members to pass fees to their customers. However, such fees would be more complex and difficult to administer. Participants were particularly sensitive to the possibility that the fee structure might create distortions to the economic activities of CAT Reporters if not set appropriately.

The Participants considered alternatives to cost allocation ranging from a strict pro-rata distribution, regardless of the type or size of the CAT Reporters, to a distribution based purely on CAT Reporter activity. Participants also considered a variety of ways to measure activity, including notional value of trading (as currently used for purposes of Section 31 fees), number of trades or quotations, and all message traffic sent. Further, Participants considered the comparability of audit trail activity across different Eligible Securities. The Participants discussed the potential approaches to funding, including the principles articulated in Article XI and an illustrative funding model, with the DAG multiple times, beginning on September 3, 2014.

After extensive analysis and taking into consideration feedback from the DAG, the Participants determined that a tiered fixed fee structure would be fair and relatively uncomplicated. The Participants discussed several approaches to developing a tiered model, including defining fee tiers based on such factors as size of firm, message traffic or trading dollar volume. For example, a review of OATS data for a recent month shows the wide range in activity among broker-dealers, with a number of broker-dealers submitting fewer than 1,000 orders for the month and other broker-dealers submitting millions and even billions of orders in the same period. The Participants also considered a tiered model where CAT Reporters would be charged different variable fees based on tier assignment. However, the Participants believe a tiered fixed fee model is preferable to a variable model because a variable model would lack the transparency, predictability, and ease of calculation afforded by fixed fees. Such factors are crucial to estimating a reliable revenue stream for the Company and to permitting CAT Reporters to reasonably predict their obligations. Moreover, the Participants believe that the tiered approach would help ensure that fees are equitably allocated among similarly situated CAT

Reporters and would further the goal of the Participants to lessen the impact on smaller firms. Irrespective of the approach taken with fees, the Participants believe that revenues generated should be aligned to the costs of building, implementing and maintaining the CAT, and if revenues collected are in excess of costs for any given year, such excess should be considered in setting fees for the following year.

Finally, the Participants believe that it is important to establish a simple fee structure that is easy to understand and administer. The Participants are committed to establishing and billing fees so that Industry Members will have certainty and the ability to budget for them. In that regard, the CAT NMS Plan expressly provides that the Operating Committee shall not make any changes to any fees on more than a semi-annual basis unless, pursuant to a Supermajority Vote, the Operating Committee concludes that such change is necessary for the adequate funding of the Company.²²⁷

8. An Analysis of the Impact on Competition, Efficiency, and Capital Formation (SEC Rule 613(a)(1)(viii))

As required by SEC Rule 613(a)(1)(viii), this section provides an analysis of the impact on competition, efficiency and capital formation of creating, implementing, and maintaining the CAT NMS Plan. In recognition of the complexity of this analysis, the Participants have evaluated a variety of sources of information to assist in the analysis of the impact of the CAT NMS Plan on competition, efficiency and capital formation. Specifically, the Participants have evaluated the many comments related to competition, efficiency and capital formation received in response to the Commission's proposal of SEC Rule 613 and during the CAT NMS Plan development process. In addition, the Participants considered the input of the DAG. Finally, the Participants used information derived from three cost studies described in the prior section on costs. Based on a review and analysis of these materials, the Participants believe that the CAT NMS Plan, as submitted, is justified given its estimated impacts on competition, efficiency and capital formation.

(a) Impact on Competition

Through an analysis of the data and information described above, the Participants have evaluated the potential impact of the CAT NMS Plan on competition, including the competitive impact on the market generally and the competitive impact on each type of Person playing a role in the market (e.g., Participants, broker-dealers, vendors, investors). Potential negative impacts on competition could arise if the CAT NMS Plan were to burden a group or class of CAT Reporters in a way that would harm the public's ability to access their services, either through increasing costs or decreased provision of those services. These impacts may be direct, as in the provision of brokerage services to individual investors, or indirect, as in the aggregate costs of managing, trading and maintaining a securities holding. These impacts should be measured relative to the economic baseline, described above.

The Participants have identified a series of potential impacts on competition that may arise as a result of the terms and conditions of the CAT NMS Plan. These potential impacts may be related to: (1) the technology ultimately used by the CAT and differences across CAT

²²⁷ See Section 11.3(d) of the CAT NMS Plan.

Reporters in their efforts necessary to meet the CAT NMS Plan's requirements; (2) the method of cost allocation across CAT Reporters; and (3) changes in regulatory reporting requirements, and their attendant costs, particularly to smaller entities, who may previously have benefited from regulatory exemptions.

In general, the Participants believe that the CAT NMS Plan will avoid disincentives such as placing an inappropriate burden on competition in the U.S. securities markets. The discussion below focuses on competition in the Participant and broker-dealer communities, where the Participants believe there is the greatest potential for impact on competition.

(i) Participants

The Participants already incur significant costs to maintain and surveil an audit trail of activity for which they are responsible. Each Participant bears these costs whether it expends internal resources to monitor relevant activity itself, or whether it contracts with others to perform these services on its behalf. The CAT NMS Plan, through the funding principles it sets forth in Section 11.2, seeks to distribute the regulatory costs associated with the development and maintenance of a meaningful and comprehensive audit trail in a principled manner. By calibrating the CAT NMS Plan's funding according to these principles, the Participants sought to avoid placing undue burden on exchanges relative to their core characteristics, including market share and volume of message traffic. Thus, the Participants do not believe that any particular exchange in either the equities or options markets would be placed at a competitive disadvantage in a way that would materially impact the respective Execution Venue marketplaces for either type of security.

In addition, because the CAT NMS Plan seeks to allocate costs in a manner consistent with the Participants' activities, the Participants do not believe that it would discourage potential new entrants. For instance, an equity ATS – which would already incur costs under the CAT NMS Plan as a reporting broker-dealer – should not be discouraged from becoming a national securities exchange because of the costs it would incur as a Participant based on its business model or pricing structure. As proposed here, the entity would be assessed exactly the same amount for a given level of activity whether it acted as an ATS or as an exchange. Accordingly, the Participants do not believe that adoption of the CAT NMS Plan would favor existing exchanges or types of exchanges vis-à-vis potential new competitors in a way that would degrade available Execution Venue services or pricing. For similar reasons, the Participants also do not believe that the costs of the CAT NMS Plan would distort the marketplace for existing or potential registered securities associations.

(ii) Broker-Dealers

Broker-dealer competition may be impacted if the direct and indirect costs associated with meeting the CAT NMS Plan's requirements materially impact the provision of their services to the public. Further, competition may be harmed if a particular class or group of broker-dealers bears the costs disproportionately, and as a result, investors have more limited choices or increased costs for certain types of broker-dealer services.

For larger broker-dealers, the Participants rely on the information obtained from the Costs to CAT Reporters Study and discussions with the industry to preliminarily conclude that the CAT NMS Plan will not likely have an adverse impact on competition. Under the CAT NMS Plan, broker-dealers would be assessed charges, as determined by the Operating Committee, for the build and maintenance of the CAT. They would also incur costs to build and maintain systems and processes necessary to submit and retain their own information to the Central Repository. The Participants' efforts to align costs with market activity leads to an outcome where dollar costs are borne significantly more by larger entities.

Additionally, large broker-dealers may view themselves as direct competitors to large Participants, in that they may provide similar execution services. The CAT NMS Plan seeks to mitigate competitive impacts by aligning the cost allocation in a manner that seeks comparability among the largest CAT Reporters regardless of their regulatory status.²²⁸

According to the Costs to CAT Reporters Study, for large broker-dealers, the average decrease in maintenance costs associated with the CAT (i.e., the cost that CAT would impose on firms beyond the current economic baseline) would be \$651,924, and the average decrease in maintenance costs for small firms would be \$726,216 using Approach 1. For Approach 2, large broker-dealers would see a decrease in maintenance costs associated with the CAT of \$1,170,548, and small firms would see a decrease in the same costs of \$763,371. These averages could suggest that the decreased costs imposed by the CAT would represent a benefit to both large and small broker-dealers' regulatory budgets. The Participants believe that the CAT NMS Plan would not materially disadvantage small broker-dealers versus large broker-dealers.

For small broker-dealers, the Participants considered their contribution to market activity as an important determinant of the amount of the cost of the CAT that they should bear. While this allocation of costs may be significant for some small firms, and may even impact their business models materially, SEC Rule 613 requires these entities to report. The Participants have not identified a way to further minimize the costs to these firms within the context of the funding principles established as part of the CAT NMS Plan.

The Participants were particularly sensitive during the development of the CAT NMS Plan to the potential burdens it could place on small broker-dealers. These broker-dealers may incur minimal costs under existing audit trail requirements because they are OATS-exempt or excluded broker-dealers or limited purpose broker-dealers. The Participants note that the CAT NMS Plan contemplates steps to diffuse the potential cost differential between large and small firms. For instance, small broker-dealers generally will have an additional year before they are required to start reporting data under the CAT NMS Plan to the Central Repository. This will permit these firms greater time to implement the changes to their own systems necessary to

²²⁸ There is empirical evidence that firms' order routing decisions respond to changes in trading fees. Such evidence finds that an increase in the level of an exchange's net fee is associated with a decrease in trading volume and market share relative to other exchanges. This evidence suggests that there is sufficient competition among Execution Venues such that where the Participant's costs for the CAT are material it may be difficult for Execution Venues to fully pass those costs to broker-dealers. This argument holds as long as broker-dealers are not able to pass such costs on to their customers. See Cardella et al., *Make and Take Fees in the U.S. Equity Market* (working paper, Apr. 29, 2013), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2149302.

comply with the Plan. Furthermore, the Participants have sought exemptive relief concerning time stamps for recording the time of Manual Order Events.

The Participants are cognizant that the method by which costs are allocated to broker-dealers may have implications for their business models that might ultimately impact competition. For instance, if the method of cost allocation created disincentives to quoting activity, certain broker-dealer's business models might be affected more greatly than others. The Participants are unable to determine whether and how changing these incentives may impact competition. Participants intend to monitor changes to overall market activity and market quality and consider appropriate changes to the cost allocation model where merited.

The Participants note that if the exemption requests that have been submitted to the Commission are not granted, the requirements of SEC Rule 613 may impose significantly greater costs that could potentially cause small broker-dealers to exit the marketplace, discourage new entrants to the small broker-dealer marketplace, or impact the broker-dealer landscape in other ways that may dampen competitive pressures.

(b) Impact on Efficiency

Through an analysis of the data and information described above, the Participants have evaluated the impact of the CAT NMS Plan on efficiency, including the impact on the time, resources and effort needed to perform various regulatory and other functions. In general, the Participants believe that the CAT NMS Plan should have a net positive effect on efficiency.

Overall, the Participants believe that the CAT NMS Plan could improve market efficiency by reducing monitoring costs and increasing efficiency in the enforcement of Participant and Commission rules. Additionally, the Participants believe that the CAT will enable the Participants and the Commission to detect more quickly wrongdoing on a cross-market basis, which may deter some market participants from taking such actions. For example, FINRA's equity cross-market surveillance patterns have already demonstrated the value of integrating data from multiple markets. FINRA has found that approximately 44 percent of the manipulation-based alerts it generated involved conduct on two or more equity markets and 43 percent of the alerts involved conduct by two or more market participants.²²⁹ A reduction in prohibited activity, as well as faster identification of such activity by regulators, would lead to a reduction in losses to investors and increased efficiency.

The CAT could also create more focused efficiencies for broker-dealers and Participants by reducing the redundant and overlapping systems and requirements identified above. For all CAT Reporters, the standardization of various technology systems will provide, over time, improved process efficiencies, including efficiencies gained through the replacement of outdated processes and technology with cost saving and related staffing reductions. Standardization of systems will improve efficiency, for both Participants and broker-dealers, in the form of resource consolidation, sun-setting of systems, consolidated legacy systems and processes and consolidated data processing. In addition, more sophisticated monitoring may reduce the number

²²⁹ Remarks of Robert Ketchum, Chairman and Chief Executive Officer, FINRA (Sept. 17, 2014), *available at* <http://www.finra.org/Newsroom/Speeches/Ketchum/P600785>.

of ad hoc information requests, thereby reducing the overall burden and increasing the operational efficiency of CAT Reporters.

CAT Reporters may also experience various long term efficiencies from the increase in surveillance capabilities, such as greater efficiencies related to administrative functions provided by enhanced regulatory access, superior system speed and reduced system downtime. Moreover, the Commission and the Participants expect to have more fulsome access to unprocessed regulatory data and timely and accurate information on market activity, thus providing the opportunity for improved market surveillance and monitoring.

Note, however, that uniform reporting of data to the Central Repository may require the development of data mapping and data dictionaries that will impose burdens in the short term. CAT Reporters also may incur additional time and direct costs to comply with new encryption mechanisms in connection with the transmission of PII data (although the quality of the process will improve).

The Participants are cognizant that the method by which costs are allocated to broker-dealers may have implications for their business models that might ultimately impact efficiency. For instance, if the method of cost allocation created disincentives to the provision of liquidity, there may be an impact on the quality of the markets and an increase in the costs to investors to transact. As a result, the Participants set forth the funding principles that will guide the selection of the cost allocation model. The Participants have also sought out evidence available to best understand how cost allocation models may impact market participation, and more importantly, ultimately market outcomes.²³⁰

The Participants intend to monitor changes to overall market activity and market quality and will consider appropriate changes to the cost allocation model where merited.

(c) Impact on Capital Formation

Through an analysis of the data and information described above, the Participants also have assessed the impact of the CAT NMS Plan on capital formation, including the impact on both investments and the formation of additional capital. In general, the Participants believe that the CAT NMS Plan will have no deleterious effect on capital formation.

In general the Participants believe that the enhanced surveillance of the markets may instill greater investor confidence in the markets, which, in turn, may prompt greater participation in the markets. It is possible that greater investor participation in the markets could bolster capital formation by supporting the environment in which companies raise capital.

Moreover, the Participants believe that the CAT NMS Plan would not discourage capital formation. As discussed in greater detail above, the Participants have analyzed the degree to which the CAT NMS Plan should cover Primary Market Transactions. Based on this analysis,

²³⁰ See, e.g., IIROC's analysis of its market regulation fee model, *available at* http://www.iiroc.ca/Documents/2011/5f95e549-10d1-473e-93cf-3250e026a476_en.pdf and http://www.iiroc.ca/Documents/2012/bf393b26-7bdf-49ff-a1fc-3904d1de3983_en.pdf.

the Participants believe that the CAT NMS Plan has been appropriately tailored so it does not create an undue burden on the primary issuances that companies may use to raise capital.

In addition, the Participants do not believe that the costs of the CAT NMS Plan would come to bear on investors in a way that would materially limit their access to or participation in the capital markets.

Finally, the Participants believe that, given the CAT NMS Plan's provisions to secure the data collected and stored by the Central Repository, the CAT NMS Plan should not discourage participation by market participants who are worried about data security and data breaches. As described more fully in the CAT NMS Plan and Appendix C, The Security and Confidentiality of the Information Reported to the Central Repository, and Appendix D, Data Security, the Plan Processor will be responsible for ensuring the security and confidentiality of data during transmission and processing, as well as at rest, and for ensuring that the data is used only for permitted purposes. The Plan Processor will be required to provide physical security for facilities where data is transmitted or stored, and must provide for the security of electronic access to data by outside parties, including Participants and the Commission, CAT Reporters, or Data Submitters. The Plan Processor must include in these measures heightened security for populating, storing, and retrieving particularly sensitive data such as PII. Moreover, the Plan Processor must develop and maintain this security program with a dedicated staff including, among others, a Chief Information Security Officer dedicated to monitoring and addressing data security issues for the Plan Processor and Central Repository, subject to regular review by the Chief Compliance Officer. The Plan Processor also will be required to provide regular reports to the Operating Committee on a number of items, including any data security issues for the Plan Processor and Central Repository.

(d) Impacts of the CAT NMS Plan Governance on Efficiency, Competition, and Capital Formation

Participants considered the impacts of the CAT NMS Plan governance on efficiency, competition, and capital formation. Participants recognize that without effective governance, it will become harder for the CAT NMS Plan to achieve its intended outcome, namely, enhanced investor protection, in an efficient manner. Participants specifically considered two areas where ineffective governance might lead to economic distortions or inefficiencies: (i) the voting protocols defined in the CAT NMS Plan both for Participants in developing the CAT, and for the Operating Committee after the adoption of the CAT NMS Plan; and (ii) the role of industry advisors within the context of CAT NMS Plan governance.

Participants understand that there may be detrimental impacts to adopting voting protocols that might impede the effective administration of the CAT System. For instance, too high a threshold for decision making may limit the ability of the body to adopt broadly agreed upon provisions. The extreme form of this would have been for the CAT NMS Plan to require unanimity on all matters. In such case, one dissenting opinion could effectively derail the entire decision-making apparatus. The inability to act in a timely way may create consequences for efficiency, competition, and capital. Conversely, if Participants set a voting threshold that is too low, it might have the impact of not giving sufficient opportunity to be heard or value to dissenting opinions and alternative approaches. As an example, if Participants were to set voting

thresholds too low, it might be possible for a set of Participants to adopt provisions that might provide them a competitive advantage over other Participants. Either forms (a too high or too low threshold) could result in negative impacts to efficiency, competition, and capital formation. These issues apply in the context of efforts of the Participants to develop the CAT NMS Plan submitted here or in the context of the Operating Committee’s responsibilities after approval of the CAT NMS Plan.

To address these concerns, Participants carefully considered which matters should require a Supermajority Vote and which matters should require a Majority Vote.²³¹ The decision required Participants to balance the protection of rights of all parties with the interest of avoiding unnecessary deadlock in the decision making process. As a result, Participants have determined that use of a Supermajority Vote should be for instances considered by the Participants to have a direct and significant impact on the functioning, management, and financing of the CAT System. This formulation, relying on Majority Vote for routine decisions and Supermajority Vote for significant matters, is intended to meet the Commission’s direction for “efficient and fair operation of the NMS plan governing the consolidated audit trail.”²³²

Participants also considered the role of industry representation as part of the governance structure. Participants recognize the importance of including industry representation in order to assure that all affected parties have a representative in discussing the building, implementation, and maintenance of the CAT System. Participants actively sought insight and information from the DAG and other industry representatives in developing the CAT NMS Plan. The CAT NMS Plan also contemplates continued industry representation through an Advisory Committee, intended to support the Operating Committee and to promote continuing efficiency in meeting the objective of the CAT.

C. IMPLEMENTATION AND MILESTONES OF THE CAT.

9. A Plan to Eliminate Existing Rules and Systems (SEC Rule 613(a)(1)(ix))

As required by SEC Rule 613(a)(1)(ix), this section sets forth a plan to eliminate rules and systems (or components thereof) that will be rendered duplicative by the consolidated audit trail, including identification of such rules and systems (or components thereof); to the extent that any existing rules or systems related to monitoring quotes, orders and executions provide information that is not rendered duplicative by the consolidated audit trail, an analysis of, among other things, whether the collection of such information remains appropriate; if still appropriate whether such information should continue to be separately collected or should instead be incorporated into the CAT; or if no longer appropriate, how the collection of such information could be efficiently terminated.

<u>Milestone</u>	<u>Completion Date</u>
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²³¹ Further discussion of the Participants’ consideration of the use of the Majority Vote and Supermajority Vote is contained in Appendix C, 11, Process by Which Participants Solicited Views of Members and Other Appropriate Parties Regarding Creation, Implementation, and Maintenance of CAT; Summary of Views; and How Sponsors Took Views Into Account in Preparing NMS Plan (SEC Rule 613(a)(1)(xi)).

²³² Adopting Release at 45787.

Identification of Duplicative Rules and Systems	
<p>Each Participant will initiate an analysis of its rules and systems to determine which require information that is duplicative of the information available to the Participants through the Central Repository. Examples of Participants’ rules to be reviewed include:</p> <ul style="list-style-type: none"> • The Participants’ rules that implement the exchange-wide Consolidated Options Audit Trail System (e.g., CBOE Rule 6.24, etc.) • FINRA rules that implement the Order Audit Trail System (OATS) including the relevant rules of the NASDAQ Stock Market, NASDAQ OMX BX, NASDAQ OMX PHLX, New York Stock Exchange, NYSE MKT, and NYSE ARCA • Option exchange rules that require the reporting of transactions in the equity underlier for options products listed on the options exchange (e.g., PHLX Rule 1022, portions of CBOE Rule 8.9, etc.) 	<p>The Participants with duplicative systems have completed gap analyses for systems and rules identified for retirement in full,²³³ and have confirmed that data that would need to be captured by the CAT to support retirement of these systems will be included in the CAT.</p>
Identification of Partially Duplicative Rules and Systems	
<p>Each Participant will initiate an analysis of its rules and systems to determine which rules and/ or systems require information that is partially duplicative of the information available to the Participants through the Central Repository. The analysis should include a determination as</p>	<p>The Participants with duplicative systems have completed gap analyses for systems and rules identified for retirement in part, and have confirmed that data that would need to be captured by the CAT to</p>

²³³ The systems and rules identified for retirement (in full or in part) include: FINRA’s OATS Rules (7400 Series), the rules of other Participants that incorporate FINRA’s OATS requirements (e.g. NASDAQ Rule 7000A Series, BX Rule 6950 Series, PHLX Rule 3400 Series, NYSE Rule 7400 Series, NYSE Arca Equities Rule 7400 Series, and NYSE MKT Rule 7400 Series), COATS and associated rules, NYSE Rule 410(b), PHLX Rule 1022, CBOE Rule 8.9, EBS and associated rules, C2 Rule 8.7, and CHX BrokerPlex reporting (Rule 5).

<p>to (1) whether the duplicative information available in the Central Repository should continue to be collected by the Participant; (2) whether the duplicative information made available in the Central Repository can be used by the Participant without degrading the effectiveness of the Participant’s rules or systems; and (3) whether the non-duplicative information should continue to be collected by the Participant or, alternatively, should be added to information collected by the Central Repository.</p> <p>Examples of Participants’ rules to be reviewed include:</p> <ul style="list-style-type: none"> • Options exchange rules that require the reporting of large options positions (e.g., CBOE Rule 4.13, etc.) • NYSE Rule 410B which requires the reporting of transactions effected in NYSE listed securities by NYSE members which are not reported to the consolidated reporting systems • Portions of CBOE Rule 8.9 concerning position reporting details 	<p>support retirement of these systems will be included in the CAT.</p>
<p>Identification of Non-Duplicative Rules or System related to Monitoring Quotes, Orders and Executions</p>	
<p>Each Participant will initiate an analysis of its rules and systems to determine which of the Participant’s rules and systems related to monitoring quotes, orders, and executions provide information that is not rendered duplicative by the consolidated audit trail. Each Participant must analyze (1) whether collection of such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail; (2) if still</p>	<p>The Participants with duplicative systems have completed gap analyses for systems and rules identified for retirement in full or in part, and have confirmed that data that would need to be captured by the CAT to support retirement of these systems will be included in the CAT.</p>

<p>appropriate, whether such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail.; and (3) if no longer appropriate, how the collection of such information could be efficiently terminated, the steps the Participants propose to take to seek Commission approval for the elimination of such rules and systems (or components thereof), and a timetable for such elimination, including a description of the phasing-in of the consolidated audit trail and phasing-out of such existing rules and systems (or components thereof).</p>	
<p>Identification of Participant Rule and System Changes Due to Elimination or Modification of SEC Rules</p>	
<p>To the extent the SEC eliminates SEC rules that require information that is duplicative of information available through the Central Repository, each Participant will analyze its rules and systems to determine whether any modifications are necessary (e.g., delete references to outdated SEC rules, etc.) to support data requests made pursuant to such SEC rules. Examples of rules the SEC might eliminate or modify as a result of the implementation of CAT include:</p> <ul style="list-style-type: none"> • SEC Rule 17a-25 which requires brokers and dealers to submit electronically to the SEC information on Customers and firms securities trading • SEC Rule 17h-1 concerning the identification of large traders and the required reporting obligations of large traders 	<p>Each Participant should complete its analysis within three (3) months after the SEC approves the deletion or modification of an SEC rule related to the information available through the Central Repository.</p> <p>The Participants will coordinate with the SEC regarding modification of the CAT NMS Plan to include information sufficient to eliminate or modify those Exchange Act rules or systems that the SEC deems appropriate.</p> <p>With respect to SEC Rule 17a-25, such coordination will include, among other things, consideration of EBS data elements and asset classes that would need to be included in the Plan, as well as the timing of when all Industry Members will be subject to the Plan.²³⁴</p> <p>Based on preliminary industry analyses, broker-dealer large trader reporting requirements under SEC Rule 13h-1</p>

²³⁴ See SEC Rule 613 – Consolidated Audit Trail (CAT) Preliminary EBS-CAT Gap Analysis, available at <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p450537.pdf>.

	<p>could be eliminated via the CAT. The same appears true with respect to broker-dealer large trader recordkeeping. Large trader reporting responsibilities on Form 13H and self-identification would not appear to be covered by the CAT.²³⁵</p>
<p>Participant Rule Changes to Modify or Eliminate Participant Rules</p>	
<p>Each Participant will prepare appropriate rule change filings to implement the rule modifications or deletions that can be made based on the Participant’s analysis of duplicative or partially duplicative rules. The rule change filing should describe the process for phasing out the requirements under the relevant rule.</p>	<p>Each Participant will file with the SEC the relevant rule change filing to eliminate or modify its duplicative rules within six (6) months of the SEC’s approval of the CAT NMS Plan, the elimination of such rules and the retirement of the related systems to be effective at such time as CAT Data meets minimum standards of accuracy and reliability. In this filing, each Participant shall discuss:</p> <p>(i) specific accuracy and reliability standards that will determine when duplicative systems will be retired, including, but not limited to, whether the attainment of a certain Error Rate should determine when a system duplicative of the CAT can be retired;</p> <p>(ii) whether the availability of certain data from Small Industry Members two years after the Effective Date would facilitate a more expeditious retirement of duplicative systems; and</p> <p>(iii) whether individual Industry Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy and reliability standards, including, but not limited to, ways in</p>

²³⁵ See FIF CAT WG: Preliminary Large Trader Rule (Rule 13h-1) – CAT (Rule 613) Gap Analysis (Feb. 11, 2014), available at <https://fif.com/fif-working-groups/consolidated-audit-trail/member-resources/current-documents?download=1221:february-11-2014-fif-cat-wg-preliminary-large-trader-rule-rule-13h-1-cat-rule-613-gap-analysis&start=35>.

	<p>which establishing cross-system regulatory functionality or integrating data from existing systems and the CAT would facilitate such Individual Industry Member exemptions.</p> <p>Between the Effective Date and the retirement of the Participants’ duplicative systems, each Participant, to the extent practicable, will attempt to minimize changes to those duplicative systems.</p>
<p>Elimination (including any Phase-Out) of Relevant Existing Rules and Systems</p>	
<p>After each Participant completes the above analysis of its rules and systems, each Participant will analyze the most appropriate and expeditious timeline and manner for eliminating such rules and systems.</p>	<p>Upon the SEC’s approval of relevant rule changes, each Participant will implement such timeline. One consideration in the development of these timelines will be when the quality of CAT Data will be sufficient to meet the surveillance needs of the Participant (i.e., to sufficiently replace current reporting data) before existing rules and systems can be eliminated.</p>

Order Audit Trail System (“OATS”)

The OATS Rules impose obligations on FINRA members to record in electronic form and report to FINRA, on a daily basis, certain information with respect to orders originated, received, transmitted, modified, canceled, or executed by members relating to OTC equity securities²³⁶ and NMS Securities.²³⁷ OATS captures this order information and integrates it with quote and transaction information to create a time-sequenced record of orders, quotes, and transactions. This information is then used by FINRA staff to conduct surveillance and investigations of member firms for potential violations of FINRA rules and federal securities laws. In general, the OATS Rules apply to any FINRA member that is a “Reporting Member,” which is defined in Rule 7410 as “a member that receives or originates an order and has an obligation to record and report information under Rules 7440 and 7450.”

Although FINRA is committed to retiring OATS in as efficient and timely a manner as practicable, its ability to retire OATS is dependent on a number of events. Most importantly,

²³⁶ See FINRA Rule 7410(l).

²³⁷ Other SROs have rules requiring their members to report information pursuant to the OATS Rules. See, e.g., NYSE Rule 7400 Series; NASDAQ Rule 7400 Series.

before OATS can be retired, the Central Repository must contain CAT Data sufficient to ensure that FINRA can effectively conduct surveillance and investigations of its members for potential violations of FINRA rules and federal laws and regulations, which includes ensuring that the CAT Data is complete and accurate. Consequently, one of the first steps taken by the Participants to address the elimination of OATS was an analysis of gaps between the informational requirements of SEC Rule 613 and current OATS recording and reporting rules. In particular, SEC Rule 613(c)(5) and (6) require reporting of data only for each NMS Security that is (a) registered or listed for trading on a national securities exchange; (b) or admitted to unlisted trading privileges on such exchange; or (c) for which reports are required to be submitted to the national securities association. SEC Rule 613(i) requires the Participants to provide to the Commission within six months after the Effective Date a document outlining how the Participants could incorporate into the consolidated audit trail information with respect to equity securities that are not NMS Securities (“OTC Equity Securities”) and debt securities (and Primary Market Transactions in such securities). Even though SEC Rule 613 does not require reporting of OTC Equity Securities, the Participants have agreed to expand the reporting requirements to include OTC Equity Securities to facilitate the elimination of OATS.²³⁸

Next, the Participants performed a detailed analysis of the current OATS requirements and the specific reporting obligations under SEC Rule 613 and concluded that there are 42 data elements found in both OATS and SEC Rule 613; however, there are 33 data elements currently captured in OATS that are not specified in SEC Rule 613.²³⁹ The Participants believe it is appropriate to incorporate data elements into the Central Repository that are necessary to retire OATS and the OATS Rules. The Participants believe that these additional data elements will increase the likelihood that the Central Repository will include sufficient order information to ensure FINRA can continue to perform its surveillance with CAT Data rather than OATS data and can, thus, more quickly eliminate OATS and the OATS Rules.

The purpose of OATS is to collect data to be used by FINRA staff to conduct surveillance and investigations of member firms for potential violations of FINRA rules and federal securities laws and regulations. SEC Rule 613 requires the Participants to include in the CAT NMS Plan a requirement that all Industry Members report information to the Central Repository within three years after the Effective Date. Consistent with this provision, under the terms of Sections 6.4 and 6.7 of the CAT NMS Plan, some Reporting Members will not be reporting information to the Central Repository until three years after the Effective Date. Because FINRA must continue to perform its surveillance obligations without interruption, OATS cannot be entirely eliminated until all FINRA members who currently report to OATS are reporting CAT Data to the Central Repository. However, FINRA will monitor its ability to integrate CAT Data with OATS data to determine whether it can continue to perform its surveillance obligations. If it is practicable to integrate the data in a way that ensures no interruption in FINRA’s surveillance capabilities, FINRA will consider exempting firms from

²³⁸ This expansion of the CAT reporting requirements to OTC Equity Securities was generally supported by members of the broker-dealer industry and was discussed with the DAG on July 24, 2013.

²³⁹ SEC Rule 613(c)(7) lists the minimum order information that must be reported to the CAT and specifies the information that must be included in the CAT NMS Plan. The Commission noted in the Adopting Release that “the SROs are not prohibited from proposing additional data elements not specified in Rule 613 if the SROs believe such data elements would further, or more efficiently, facilitate the requirements of [SEC Rule 613].” Adopting Release at 45750.

the OATS Rules provided they report data to the Central Repository pursuant to the CAT NMS Plan and any implementing rules.

FINRA’s ability to eliminate OATS reporting obligations is dependent upon the ability of the Plan Processor and FINRA to work together to integrate CAT Data with the data collected by OATS. FINRA is committed to working diligently with the Plan Processor to ensure this process occurs in a timely manner; however, it is anticipated that Reporting Members will have to report to both OATS and the Central Repository for some period of time until FINRA can verify that the data into the Central Repository is of sufficient quality for surveillance purposes and that all reporting requirements meet the established steady state Error Rates set forth in Section A.3(b). Once this is verified, FINRA’s goal is to minimize the dual-reporting requirement.

Finally, the Participants note that, pursuant to Section 19 of the Exchange Act, the amendment or elimination of the OATS Rules can only be done with Commission approval. Approval of any such filings is dependent upon a number of factors, including public notice and comment and required findings by the Commission before it can approve any amendments; therefore, FINRA cannot speculate how long this process may ultimately take.

10. Objective Milestones to Assess Progress (SEC Rule 613(a)(1)(x))

As required by SEC Rule 613(a)(1)(x), this section sets forth a series of detailed objective milestones, with required completion dates, toward implementation of the consolidated audit trail.

(a) Publication and Implementation of the Methods for Providing Information to the Customer-ID Database

Milestone	Completion Date
Selection of Plan Processor	
Participants jointly select the Initial Plan Processor pursuant to the process set forth in Article V of the CAT NMS Plan	No later than 2 months after Effective Date
Industry Members (other than Small Industry Members²⁴⁰)	
Plan Processor begins developing the procedures, connectivity requirements and Technical Specifications for Industry Members to report Customer Account Information and Customer Identifying Information to the Central Repository	No later than 15 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository

²⁴⁰ Small broker-dealers are defined SEC Rule 0-10(c).

Plan Processor publishes iterative drafts of the procedures, connectivity requirements and Technical Specifications for Industry Members to Report Customer Account Information and Customer Identifying Information to the Central Repository	As needed before publishing the final documents
Plan Processor publishes the procedures, connectivity requirements and Technical Specifications for Industry Members to report Customer Account Information and Customer Identifying Information to the Central Repository	No later than 6 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Industry Members (other than Small Industry Members) begin connectivity and acceptance testing with the Central Repository	No later than 3 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Industry Members (other than Small Industry Members) begin reporting customer / institutional / firm account information to the Central Repository for processing	No later than 1 month before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Small Industry Members	
Small Industry Members begin connectivity and acceptance testing with the Central Repository	No later than 3 months before Small Industry Members are required to begin reporting data to the Central Repository
Small Industry Members begin reporting customer / institutional / firm account information to the Central Repository for processing	No later than 1 month before Small Industry Members are required to begin reporting data to the Central Repository

(b) Submission of Order and MM Quote Data to Central Repository

Milestone	Completion Date
Participants	

Plan Processor begins developing Technical Specification(s) for Participant submission of order and MM Quote data	No later than 10 months before Participants are required to begin reporting data to the Central Repository
Plan Processor publishes iterative drafts of Technical Specification(s)	As needed before publishing of the final document
Plan Processor publishes Technical Specification(s) for Participant submission of order and MM Quote data	No later than 6 months before Participants are required to begin reporting data to the Central Repository
Plan Processor begins connectivity testing and accepting order and MM Quote data from Participants for testing purposes	No later than 3 months before Participants are required to begin reporting data to the Central Repository
Plan Processor plans specific testing dates for Participant testing of order and MM Quote submission	No later than 3 months before Participants are required to begin reporting data to the Central Repository
Industry Members (other than Small Industry Members)	
Plan Processor begins developing Technical Specification(s) for Industry Members submission of order data	No later than 15 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Plan Processor publishes iterative drafts of Technical Specification(s)	As needed before publishing of the final document
Plan Processor publishes Technical Specification(s) for Industry Member submission of order data	No later than 1 year before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Participant exchanges that support options MM quoting publish specifications for adding Quote Sent time to Quoting APIs	No later than 6 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository

Plan Processor makes the testing environment available on a voluntary basis and begins connectivity testing and accepting order data from Industry Members (other than Small Industry Members) for testing purposes	No later than 6 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Plan Processor and Industry Members begin coordinated and structured testing of order submission	No later than 3 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Participant exchanges that support options MM quoting begin accepting Quote Sent time on Quotes	No later than 1 month before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Small Industry Members	
Plan Processor makes the testing environment available on a voluntary basis and begins connectivity testing and accepting order data from Small Industry Members for testing purposes	No later than 6 months before Small Industry Members are required to begin reporting data to the Central Repository
Plan Processor and Small Industry Members begin coordinated and structured testing of order submissions	No later than 3 months before Small Industry Members are required to begin reporting data to the Central Repository

(c) Linkage of Lifecycle of Order Events

Milestone	Completion Date
Participants	
Using order and MM Quote data submitted during planned testing, Plan Processor creates linkages of the lifecycle of order events based on the received data	No later than 3 months before Participants are required to begin reporting data to the Central Repository

Participants must synchronize Business Clocks in accordance with Section 6.8 of the CAT NMS Plan	No later than 4 months after effectiveness of the CAT NMS Plan
Industry Members (other than Small Industry Members)	
Using order and MM Quote data submitted during planned testing, Plan Processor creates linkages of the lifecycle of order events based on the received data	No later than 6 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Industry Members must synchronize Business Clocks in accordance with Section 6.8 of the CAT NMS Plan	No later than 4 months after effectiveness of the CAT NMS Plan
Small Industry Members	
Using order and MM Quote data submitted during planned testing, Plan Processor creates linkages of the lifecycle of order events based on the received data	No later than 6 months before Small Industry Members are required to begin reporting data to the Central Repository
Industry Members must synchronize Business Clocks in accordance with Section 6.8 of the CAT NMS Plan	No later than 4 months after effectiveness of the CAT NMS Plan

(d) Access to the Central Repository for Regulators

Milestone	Completion Date
Plan Processor publishes a draft document detailing methods of access to the Central Repository for regulators	No later than 6 months before Participants are required to begin reporting data to the Central Repository
Plan Processor publishes a finalized document detailing methods of access to the Central Repository for regulators, including any relevant APIs, GUI descriptions, etc. that will be supplied for access	No later than 1 month before Participants are required to begin reporting data to the Central Repository
Plan Processor provides (1) test information, either from Participant testing or from other test data, for regulators to test use of the Central Repository and (2) regulators connectivity to the Central Repository test environment and production environments	No later than 1 month before Participants are required to begin reporting data to the Central Repository
Plan Processor provides regulators access to test data for Industry Members (other than Small Industry Members)	No later than 6 months before Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository
Plan Processor provides regulators access to test data for Small Industry Members	No later than 6 months before Small Industry Members are required to begin reporting data to the Central Repository

- (e) **Integration of Other Data (“Other Data” includes, but is not limited to, SIP quote and trade data, OCC data, trade and quote information from Participants and reference data)**

Milestone	Completion Date
Operating Committee finalizes Other Data requirements	No later than 10 months before Participants are required to begin reporting data to the Central Repository
Plan Processor determines methods and requirements for each additional data source and publish applicable Technical Specifications, if required	No later than 3 months before Participants are required to begin reporting data to the Central Repository
Plan Processor begins testing with Other Data sources	No later than 1 month before Participants are required to begin reporting data to the Central Repository
Plan Processor begins accepting Other Data sources	No later than concurrently when Participants report to the Central Repository

- D. PROCESS FOLLOWED TO DEVELOP THE NMS PLAN.** These considerations require the CAT NMS Plan to discuss: (i) the views of the Participants’ Industry Members and other appropriate parties regarding the creation, implementation, and maintenance of the CAT; and (ii) the alternative approaches to creating, implementing, and maintaining the CAT considered and rejected by the Participants.

11. Process by Which Participants Solicited Views of Members and Other Appropriate Parties Regarding Creation, Implementation, and Maintenance of CAT; Summary of Views; and How Sponsors Took Views Into Account in Preparing NMS Plan (SEC Rule 613(a)(1)(xi))

(a) Process Used to Solicit Views:

When the Participants first began creating a CAT pursuant to SEC Rule 613, the Participants developed the following guiding principles (the “Guiding Principles”):

- i. The CAT must meet the specific requirements of SEC Rule 613 and achieve the primary goal of creating a single, comprehensive audit trail to enhance regulators’ ability to surveil the U.S. markets in an effective and efficient way.

- ii. The reporting requirements and technology infrastructure developed must be adaptable to changing market structures and reflective of trading practices, as well as scalable to increasing market volumes.
- iii. The costs of developing, implementing, and operating the CAT should be minimized to the extent possible. To this end, existing reporting structures and technology interfaces will be utilized where practicable.
- iv. Industry input is a critical component in the creation of the CAT. The Participants will consider industry feedback before decisions are made with respect to reporting requirements and cost allocation models.

The Participants explicitly recognized in the Guiding Principles that meaningful input by the industry was integral to the successful creation and implementation of the CAT, and as outlined below, the Participants have taken numerous steps throughout this process to ensure the industry and the public have a voice in the process.

(i) General Industry Solicitation

SEC Rule 613 was published in the Federal Register on August 1, 2012, and the following month, the Participants launched the CAT NMS Plan Website, which includes a dedicated email address for firms or the public to submit views on any aspect of the CAT. The CAT NMS Plan Website has been used as a means to communicate information to the industry and the public at large since that time. Also beginning in September 2012, the Participants hosted several events intended to solicit industry input regarding the CAT NMS Plan. A summary of the events is provided below:²⁴¹

- *CAT Industry Call (September 19, 2012)*. The Participants provided an overview of SEC Rule 613, the steps the Participants were taking to develop a CAT NMS Plan as required by SEC Rule 613, and how the Participants planned to solicit industry comments and feedback on key implementation issues.
- *CAT Industry Events (October 2012)*. The Participants provided an overview of SEC Rule 613 and the steps the Participants were taking to develop an NMS Plan as required by SEC Rule 613. The events included an open Q & A and feedback session so that Industry Members could ask questions of the Participants and share feedback on key implementation issues. Two identical sessions were held on October 15, 2012 from 2:00 p.m. to 4:00 p.m. and on October 16, 2012 from 10:00 a.m. to 12:00 p.m. A total of 89 Industry Members attended the October 15 event in person, and a total of 162 Industry Members attended it by phone. A total of 130 Industry Members attended the October 16 event in person, and a total of 48 Industry Members attended it by phone.

²⁴¹ These events are also described on the CAT NMS Plan Website at www.catnmsplan.com. See SEC Rule 613: Consolidated Audit Trail (CAT), Past Events and Announcements (last updated Dec. 10, 2014), available at <http://catnmsplan.com/PastEvents/>.

- *CAT Industry Call and WebEx (November 29, 2012)*. The Participants provided an update on CAT NMS Plan development efforts including the process and timeline for issuing the RFP to solicit Bids to build and operate the CAT.
- *CAT Industry Events (February 27, 2014 and April 9, 2014)*. During these two events, the Participants provided an overview of the latest progress on the RFP process and the overall development of the NMS Plan. A total of 120 Industry Members attended the February event in person, and a total of 123 Industry Members attended it by phone. A total of 46 Industry Members attended the April event in person, and a total of 76 Industry Members attended it by phone.
- *CAT Cost Study Webinars (June 25, 2014 and July 9, 2014)*. The Participants hosted two Webinars to review and answer questions related to the Reporter Cost Study. There were approximately 100 to 120 Industry Members on each call.
- *CAT Industry Call and WebEx (December 10, 2014)*. The Participants provided an update on CAT NMS Plan development efforts, including filing of the CAT NMS Plan on September 30, 2014, the development of a funding model, and the PPR, which documents additional requirements for the CAT.

For the above events, documentation was developed and presented to attendees, as well as posted publicly on the CAT NMS Plan Website.

In addition to the above events, some Participants individually attended or participated in additional industry events, such as SIFMA conferences and FIF working groups, where they provided updates on the status of CAT NMS Plan development and discussed areas of expected CAT functionality.

The Participants received general industry feedback from broker-dealers and software vendors.²⁴² The Participants reviewed such feedback in detail, and addressed as appropriate while developing the RFP.

The Participants also received industry feedback in response to solicitations by the Participants for industry viewpoints as follows:

- *Proposed RFP Concepts Document (published December 5, 2012, updated January 16, 2013)*. The Participants published via the CAT NMS Plan Website this document to solicit feedback on the feasibility and cost of implementing the CAT reporting requirements being considered by the Participants. Feedback was received from seven organizations, including software vendors, industry associations and broker-dealers, and the Participants discussed and addressed the feedback as appropriate in the final RFP document.
- *Representative Order Scenarios Solicitation for Feedback (February 1, 2013)*. The Participants solicited feedback via the CAT NMS Plan Website on potential CAT

²⁴² See generally Industry Feedback on the Consolidated Audit Trail (last updated Feb. 17, 2015), available at <http://catnmsplan.com/industryFeedback/>.

reporting requirements to facilitate the reporting of representative orders. Approximately 30 responses were received.

- *CAT Industry Solicitation for Feedback Concerning Selected Topics Related to NMS Plan (April 22, 2013)*. The Participants solicited feedback via the CAT NMS Plan Website on four components of the CAT NMS Plan: (1) Primary Market Transactions; (2) Advisory Committee; (3) Time Stamp Requirement; and (4) Clock Synchronization. Approximately 80 Industry Members provided responses. FIF, SIFMA, and Thomson Reuters submitted detailed responses to the request for comments.
- *CAT Industry Solicitation for Feedback Concerning Selected Topics Related to NMS Plan (June 2013)*. The Participants solicited feedback via the CAT NMS Plan Website concerning Customer identifiers, Customer information, CAT-Reporter-IDs, CAT-Order-IDs, CAT intra-firm order linkages, CAT inter-firm order linkages, broker-dealer CAT order-to-exchange order linkages, data transmission, and error correction.
- *CAT Industry Feedback on Clock Drift and Time Stamp Issues (September 2013)*. The Participants solicited feedback via the DAG concerning the implementation impact associated with a 50 millisecond clock drift requirement for electronic orders and executions.
- *Cost Survey on CAT Reporting of Options Market Maker Quotes (November 2013)*. The Participants solicited feedback via the DAG concerning the implementation impact and costs associated with reporting of quotes by options market makers to the Central Repository.
- *Cost Estimates for CAT Exemptive Relief (December 2014)*. The Participants solicited feedback via the DAG regarding minimum additional costs to be expected by Industry Members in the absence of the requested Exemptive Relief.
- *Cost Estimate for Adding Primary Market Transactions in CAT (February 2015)*. The Participants solicited feedback via the DAG concerning the feasibility and costs of broker-dealers to report to the Central Repository information regarding primary market transactions in NMS securities.
- *Clock Offset Survey (February 2015)*. The Participants solicited further feedback via the DAG concerning current broker-dealer clock synchronization practices and expected costs associated with complying with a 50ms, 5ms, 1ms, and 100 microsecond clock drift requirement for electronic orders and executions.

Feedback on these topics was received primarily through discussion during meetings of the DAG.

(ii) The Development Advisory Group (DAG)

In furtherance of Guiding Principle (iv) above, the Participants solicited members for the DAG in February 2013 to further facilitate input from the industry regarding various topics that are critical to the success of the CAT NMS Plan. Initially, the DAG consisted of 10 firms that represented large, medium, and small broker-dealers, the Options Clearing Corporation (OCC), a service bureau and three industry associations: the Security Traders Association (STA), SIFMA, and FIF.

In March 2014, the Participants invited additional firms to join the DAG in an effort to ensure that it reflected a diversity of perspectives. At this time, the Participants increased the membership of the DAG to include 12 additional firms. As of January 2015, the DAG consisted of the Participants and Representatives from 24 firms and industry associations.

The DAG has had 49 meetings since April 2013. Topics discussed with the DAG have included:

- *CAT Plan Feedback.* The Participants shared draft versions of the CAT NMS Plan, including the PPR, as it was being developed with the DAG, who provided feedback to the Participants. The Participants reviewed and discussed this feedback with the DAG, and incorporated portions of it into the CAT NMS Plan.
- *Options Market Maker Quotes.* The DAG discussed the impact of options market maker quotes on the industry. A cost analysis was conducted by the industry trade associations to analyze the impact of market maker quote reporting, as well as adding a “quote sent” time stamp to messages sent to exchanges by all options market makers. The Participants included in the Exemptive Request Letters a request for exemptive relief related to option market maker quotes given that exchanges will be reporting this data to the CAT.
- *Customer-ID.* The DAG discussed the requirements for capturing Customer-ID. The Participants proposed a Customer Information Approach in which broker-dealers assign a unique Firm Designated ID to each Customer and the Plan Processor creates and stores the Customer-ID. This concept was supported by the DAG and the Participants included in the Exemptive Request Letters a request for exemptive relief related to the Customer-ID to reduce the reporting on CAT Reporters.
- *Time Stamp, Clock Synchronization and Clock Drift.* The DAG discussed time stamps in regards to potential exemptive relief on the time stamp requirements for allocations and Manual Order Events. In addition, industry clock synchronization processes were discussed as well as the feasibility of specific clock drift requirements (e.g., 50ms), with the DAG and the FIF conducting an industry survey to identify the costs and challenges associated with various levels of clock synchronization requirements.²⁴³ The Participants included in the Exemptive Request Letters a request for exemptive relief related to manual time stamps.

²⁴³ See FIF, Clock Offset Survey Preliminary Report (last updated Feb. 17, 2015), available at <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p602479.pdf> (the “FIF Clock Offset Survey Preliminary Report”).

- *Exemptive Request Letters.* In addition to the specific areas detailed above (Options Market Maker Quotes, Customer-ID, and Time Stamp, Clock Synchronization, and Clock Drift), the DAG provided input and feedback on draft versions of the Exemptive Request Letters prior to their filing with the SEC, including cost estimates to firms and the Industry as a whole should the exemptive requests not be granted. This feedback was discussed by the Participants and the DAG and incorporated into the Exemptive Request Letters. The DAG also provided input and feedback on the Exemptive Request Letters covering Linking Allocations to Executions and Account Effective Date submitted on April 3, 2015 and September 2, 2015 respectively.
- *Primary Markets.* At the request of the Participants, the DAG discussed with the Participants the feasibility, costs, and benefits associated with reporting allocations of NMS Securities in Primary Market Transactions. The DAG further provided estimated costs associated with reporting allocations of NMS Securities in Primary Market Transactions at the top-account and sub-account levels, which was incorporated into the CAT NMS Plan.²⁴⁴
- *Order Handling Scenarios.* The DAG discussed potential CAT reporting requirements for certain order handling scenarios and additional corresponding sub-scenarios (e.g., riskless principal order and sub-scenarios involving post-execution print-for-print matching, pre-execution one-to-one matching, pre-execution many-to-one matching, complex options and auctions) An Industry Member and Participant working group was established to discuss order handling scenarios in more detail.
- *Error Handling and Correction Process.* The DAG discussed error handling and correction process. Industry Members of the DAG provided recommendations for making the CAT error correction processes more efficient. The Participants have reviewed and analyzed these recommended solutions for error correction processes and incorporated them in the requirements for the Plan Processor.
- *Elimination of Systems.* The DAG discussed the gaps between CAT and both OATS and EBS. An OATS-EBS-CAT gap analysis was developed and published on the CAT NMS Plan Website to identify commonalities and redundancies between the systems and the functionality of the CAT. Additionally, gaps between LTID and the CAT were also developed. Additional examples of systems and rules being analyzed include, but are not limited to: CBOE Rule 8.9, PHLX Rule 1022, COATS, Equity Cleared Reports, LOPR, and FINRA Rule 4560.
- *Cost and Funding of the CAT.* The DAG helped to develop the cost study that was distributed to Industry Members. Additionally, the Participants have discussed with the DAG the funding principles for the CAT and potential funding models.

²⁴⁴ See DAG, Cost Estimate for Adding Primary Market Transactions into CAT (Feb. 17, 2015), available at <http://catnmsplan.com/industryFeedback/P602480>.

In addition, a subgroup of the DAG has met six times to discuss equity and option order handling scenarios, order types, how and whether the orders are currently reported and how linkages could be created for the orders within the CAT.

(b) Summary of Views Expressed by Members and Other Parties and How Participants Took Those Views Into Account in Preparing the CAT NMS Plan

The various perspectives of Industry Members and other appropriate parties informed the Participants' consideration of operational and technical issues during the development of the CAT NMS Plan. In addition to the regular DAG meetings and special industry calls and events noted above, the Participants conducted multiple group working sessions to discuss the industry's unique perspectives on CAT-related operational and technical issues. These sessions included discussions of options and equity order scenarios and the RFP specifications and requirements.

Industry feedback was provided to Participants through gap analyses, cost studies, comment letters and active discussion in DAG meetings and industry outreach events. Specific topics on which the industry provided input include:

Overall Timeline. Industry Members expressed a concern that the original timeline for implementation of the CAT is significantly shorter than the timeline for other large scale requirements such as Large Trader Reporting. The industry requested that, in developing the overall timeline for development and implementation of the CAT NMS Plan, the Participants account for additional industry comment/input on specifications in the official timeline and discussed risk mitigation strategies for implementation of the Central Repository.

Request for proposal. The Participants provided relevant excerpts of the RFP to DAG members for review and input. These sections were discussed by the Participants, and appropriate feedback was incorporated prior to publishing the RFP.

Options Market Maker Quotes. Industry Members expressed the view that requiring market makers to provide quote information to the CAT will be duplicative of information already being submitted to the CAT by the exchanges. Participants worked closely with DAG members to develop an alternative approach that will meet the goals of SEC Rule 613, and which is detailed in the Exemptive Request Letter that the Participants submitted to the Commission related to manual time stamps.

Customer-ID. Extensive DAG discussions reviewed the Customer-ID requirements in SEC Rule 613. The industry expressed significant concern that the complexities of adding a unique CAT customer identifier to order reporting would introduce significant costs and effort related to the system modifications and business process changes broker-dealers would face in order to implement this requirement of SEC Rule 613. Working with Industry Members, the Participants proposed a Customer Information Approach in which broker-dealers would assign a unique Firm Designated ID to each Customer which the Plan Processor would retain. Additional feedback was provided by the DAG for the use of the Legal Entity Identifier ("LEI") as a valid unique customer identifier as an alternative to Tax Identification Numbers to identify non-natural

person accounts. This Customer Information Approach is included in the Exemptive Request Letters that the Participants submitted to the Commission.

Error Correction. DAG members discussed the criticality of CAT Data quality to market surveillance and reconstruction, as well as the need for a robust process for the timely identification and correction of errors. Industry Members provided feedback on error correction objectives and processes, including the importance of those data errors not causing linkage breaks. This feedback was incorporated into the RFP and relevant portions of the PPR.

Industry Members also suggested that CAT Reporters be provided access to their submitted data. Participants discussed the data security and cost considerations of this request and determined that it was not a cost-effective requirement for the CAT.

Governance of the CAT. Industry Members provided detailed recommendation for the integration of Industry Members into the governance of the CAT, including an expansion of the proposed Advisory Committee to include industry associations such as FIF and SIFMA. Industry Members also recommended a three-year term with one-third turnover per year is recommended to provide improved continuity given the complexity of CAT processing.

The Participants have discussed CAT governance considerations with the DAG at several meetings. The Participants incorporated industry feedback into the CAT NMS Plan to the extent possible in light of the regulatory responsibilities placed solely upon the Participants under the provisions of SEC Rule 613. The proposed structure and composition of the Advisory Committee in Article 4.12 was discussed with the DAG in advance of the submission of this Plan.

Role of Operating Committee. The Operating Committee, consisting of one voting member representing each Participant, is structured to ensure fair and equal representation of the Participants in furtherance of SEC Rule 613(b)(1). The overarching role of the Operating Committee is to manage the Company and the CAT System similar to the manner in which a board of directors manages the business and affairs of a corporation. The primary and more specific role of the Operating Committee is to make all policy decisions on behalf of the Company in furtherance of the functions and objectives of the Company under the Exchange Act, any rules thereunder, including SEC Rule 613, and the CAT NMS Plan. In connection with its role, the Operating Committee has the right, power and authority to exercise all of the powers of the Company, to make all decisions, and to authorize or otherwise approve all actions by the Company, except as otherwise provided by applicable law or as otherwise provided in the CAT NMS Plan (Section 4.1 of the CAT NMS Plan). The Operating Committee also monitors, supervises and oversees the actions of the Plan Processor, the Chief Compliance Officer and the Chief Information Security Officer, all of whom are involved with the CAT System on a more detailed and day-to-day basis.

The decisions made by the Operating Committee include matters that are typically considered ordinary course for a governing body like a board of directors (e.g., approval of compensation of the Chief Compliance Officer (Section 6.2(a)(iv) the CAT NMS Plan) and approval to hold an executive session of the Operating Committee (Section 4.3(a)(v) of the CAT NMS Plan)), in addition to matters that are specific to the functioning, management and

financing of the CAT System (e.g., changes to Technical Specifications (Sections 4.3(b)(vi)-(vii) of the CAT NMS Plan) and significant changes to the CAT System (Section 4.3(b)(v) of the CAT NMS Plan)).

The CAT NMS Plan sets forth a structure for decisions that the Operating Committee may make after approval of the CAT NMS Plan by the SEC. These decisions relate to events that may occur in the future as a result of the normal operation of any business (e.g., additional capital contributions (Section 3.8 of the CAT NMS Plan), approval of a loan to the Company (Section 3.9 of the CAT NMS Plan)) or that may occur due to the operation of the CAT System (e.g., the amount of the Participation Fee to be paid by a prospective Participant (Section 3.3(a) of the CAT NMS Plan)). These decisions cannot be made at the time of approval of the CAT NMS Plan because the Operating Committee will need to make its determination based on the facts and circumstances as they exist in the future. For example, in determining the appropriate Participation Fee, the Operating Committee will apply the factors identified in Section 3.3 of the CAT NMS Plan (e.g., costs of the Company and previous fees paid by other new Participants) to the facts existing at the time the prospective Participant is under consideration. Another example is the establishment of funding for the Company and fees for Participants and Industry Members. Section 11.2 of the CAT NMS Plan sets forth factors and principles that the Operating Committee will use in determining the funding of the Company. The Operating Committee then has the ability to review the annual budget and operations and costs of the CAT System to determine the appropriate funding and fees at the relevant future time. This approach, which sets forth standards at the time the CAT NMS Plan is approved that will be applied to future facts and circumstances, provides the Operating Committee with guiding principles to aid its decision-making in the future.

The Participants also recognize that certain decisions that are fundamental and significant to the operation of the Company and the CAT System must require the prior approval of the SEC, such as the use of new factors in determining a Participation Fee (Section 3.3(b)(v) of the CAT NMS Plan). In addition, any decision that requires an amendment to the CAT NMS Plan, such as termination of a Participant (Section 3.7(b) of the CAT NMS Plan), requires prior approval of the SEC (Section 12.3 of the CAT NMS Plan).

The Operating Committee has the authority to delegate administrative functions related to the management of the business and affairs of the Company to one or more Subcommittees and other Persons; however, the CAT NMS Plan expressly states that the Operating Committee may not delegate its policy-making functions (except to the extent policy-making determinations are already delegated as set forth in the CAT NMS Plan, which determinations will have been approved by the SEC) (Section 4.1 of the CAT NMS Plan). For example, the CAT NMS Plan provides for the formation of a Compliance Subcommittee to aid the Chief Compliance Officer in performing compliance functions, including (1) the maintenance of confidentiality of information submitted to the CAT; (2) the timeliness, accuracy and completeness of information; and (3) the manner and extent to which each Participant is meeting its compliance obligations under SEC Rule 613 and the CAT NMS Plan (Section 4.12(b) of the CAT NMS Plan). The Operating Committee also has delegated authority to the Plan Processor with respect to the normal day-to-day operating function of the Central Repository (Section 6.1 of the CAT NMS Plan). Nevertheless, decisions made by the Plan Processor that are more significant in nature remain subject to approval by the Operating Committee, such as decisions related to the

implementation of policies and procedures (Section 6.1(c) of the CAT NMS Plan), appointment of the Chief Compliance Officer, Chief Information Officer, and Independent Auditor (Section 6.1(b) of the CAT NMS Plan), Material System Changes or any system changes for regulatory compliance (Sections 6.1(i) and 6.1(j) of the CAT NMS Plan). In addition, the Operating Committee will conduct a formal review of the Plan Processor's performance under the CAT NMS Plan on an annual basis (Section 6.1(n) of the CAT NMS Plan). As to Subcommittees that the Operating Committee may form in the future, the Participants have determined that the Operating Committee will establish a Selection Subcommittee to select a successor Plan Processor when the time arises (Section 6.1(t) of the CAT NMS Plan). In the future, the Operating Committee will take a similar approach when delegating authority by providing Subcommittees or other Persons with discretion with respect to administrative functions and retaining authority to approve decisions related to policy and other significant matters of the Company and the CAT System.

The role of the Operating Committee, including the delegation of its authority to Subcommittees and other limited Persons, as provided in the CAT NMS Plan is similar to that of other national market system plans, including the Limited Liability Company Agreement of the Options Price Reporting Authority, LLC. It also is based on rules and regulations under the Exchange Act, and general principles with respect to the governance of a limited liability company. All decisions made by the Operating Committee will be governed by the guiding principles of the CAT NMS Plan and SEC Rule 613.

Voting Criteria of the Operating Committee: This section describes the voting criteria for decisions made by the Operating Committee, which consists of a representative for each Participant, and by any Subcommittee of the Operating Committee in the management and supervision of the business of the Company and the CAT System.

A Majority Vote (an affirmative vote of at least a majority of all members of the Operating Committee or any Subcommittee authorized to vote on a particular matter) is the default standard for decisions that are typically considered ordinary course matters for a governing body like a board of directors or board of managers or that address the general governance and function of the Operating Committee and its Subcommittees. All actions of the Company requiring a vote by the Operating Committee or any Subcommittee requires authorization by a Majority Vote except for matters specified in certain sections of the CAT NMS Plan described below, which matters require either a Supermajority Vote or a unanimous vote. As a general matter, the approach adopted by the Operating Committee is consistent with the voting criteria of the NASDAQ Unlisted Trading Privileges Plan (the "NASDAQ UTP Plan"), the Limited Liability Company Agreement of the Options Price Reporting Authority, LLC, the Consolidated Quotation Plan and the Consolidated Tape Association Plan.

A Supermajority Vote (an affirmative vote of at least two-thirds of all of the members of the Operating Committee or any Subcommittee authorized to vote on a particular matter) is required to authorize decisions on matters that are outside ordinary course of business and are considered by the Participants to have a direct and significant impact on the functioning, management and financing of the CAT System. This approach was informed by similar plans (e.g., the NASDAQ UTP Plan, which requires a unanimous vote in many similar circumstances); however, the CAT NMS Plan has the lower requirement of a Supermajority Vote because

overuse of the unanimity requirement makes management and oversight difficult. This approach takes into account concerns expressed by the Participants regarding management of the CAT NMS Plan, and is consistent with suggestions in the Adopting Release for the Participants to take into account the need for efficient and fair operation of the CAT NMS Plan and to consider the appropriateness of a unanimity requirement and the possibility of a governance requirement other than unanimity, or even supermajority approval, for all but the most important decisions.

The Participants believe that certain decisions that may directly impact the functioning and performance of the CAT System should be subject to the heightened standard of a Supermajority Vote, such as: selection and removal of the Plan Processor and key officers; approval of the initial Technical Specifications; approval of Material Amendments to the Technical Specifications proposed by the Plan Processor; and direct amendments to the Technical Specifications by the Operating Committee. In addition, the Participants believe the instances in which the Company enters into or modifies a Material Contract, incurs debt, makes distributions or tax elections or changes fee schedules should be limited, given that the Company is intended to operate on a break-even basis. Accordingly, those matters should also require the heightened standard of a Supermajority Vote.

A unanimous vote of all Participants is required in only three circumstances. First, a decision to obligate Participants to make a loan or capital contribution to the Company requires a unanimous vote (Section 3.8(a) of the CAT NMS Plan). Requiring Participants to provide additional financing to the Company is an event that imposes an additional and direct financial burden on each Participant, thus it is important that each Participant's approval is obtained. Second, a decision by the Participants to dissolve the Company requires unanimity (Section 10.1 of the CAT NMS Plan). The dissolution of the Company is an extraordinary event that would have a direct impact on each Participant's ability to meet its compliance requirements so it is critical that each Participant consents to this decision. Third, a unanimous vote is required if Participants decide to take an action by written consent in lieu of a meeting (Section 4.10 of the CAT NMS Plan). In that case, because Participants will not have the opportunity to discuss and exchange ideas on the matter under consideration, all Participants must sign the written consent. This approach is similar to the unanimity requirement under the Delaware General Corporation Law for decisions made by written consent of the directors of a corporation in lieu of a meeting.

Voting on Behalf of Affiliated Participants: Each Participant has one vote on the Operating Committee to permit equal representation among all the Participants. Initially, the Operating Committee will have 19 Participants. Of the 19 Participants, there are five Participants that are part of the Affiliated Participants Group and five Participants without any Affiliated Participants. Because of the relationship between the respective Affiliated Participants and given the large number of Participants on the Operating Committee, the Participants believe an efficient and effective way of structuring the Operating Committee in order to have an orderly and well-functioning committee is to permit but not require one individual to serve as a voting member for multiple Affiliated Participants. This approach does not change the standard rule that each Participant has one vote. This approach provides Affiliated Participants with the flexibility to choose whether to have one individual represent one or more of the Affiliated Participants or to have each of them represented by a separate individual. Affiliated Participants may likely vote on a matter similarly, and allowing them to choose the same individual as a voting member would be a convenient and practical way of having the Affiliated Participants'

votes cast. Because there is no requirement that the representative of multiple Affiliated Participants cast the same vote for all represented Participants, there is no practical difference between this approach and an approach that mandates a separate representative for each Participant. In addition, the Participants considered whether this approach would result in less participation because of a reduced number of individuals on the Operating Committee. If each group of Affiliated Participants were to choose one individual to serve as a voting member, there would be still be 10 individuals on the Operating Committee, which the Participants do not believe would cause less active representation or participation or would otherwise lead to unwanted concentration on the Operating Committee.

Affiliated Participant Groups and Participants without Affiliations:

1. New York Stock Exchange LLC; NYSE Arca, Inc.; NYSE MKT LLC
2. The NASDAQ Stock Market LLC; NASDAQ OMX BX, Inc.; NASDAQ OMX PHLX LLC
3. BATS Exchange, Inc.; BATS Y-Exchange, Inc.; EDGX Exchange, Inc.; EDGA Exchange, Inc.
4. Chicago Board Options Exchange, Incorporated; C2 Options Exchange, Incorporated
5. International Securities Exchange, LLC; ISE Gemini, LLC
6. National Stock Exchange, Inc.
7. Chicago Stock Exchange, Inc.
8. BOX Options Exchange LLC
9. Miami International Securities Exchange LLC
10. Financial Industry Regulatory Authority, Inc.

Conflicts of Interest Definition: The Participants arrived at the definition of Conflicts of Interest set forth in Article I of the CAT NMS Plan based on a review of existing rules and standards of securities exchanges, other plans, including the Selection Plan as to qualifications of a Voting Senior Officer of a Bidding Participant, and general corporate and governance principles.

Transparency in the Bidding and Selection Process: DAG members requested input into the bidding and selection process for the Plan Processor, citing the extensive impact of CAT requirements on the industry as well as proposed cost for compliance. Specifically, Industry Members requested that non-proprietary aspects of the responses to the RFP should be available to the public to inform the discussion regarding the costs and benefits of various CAT features and the technological feasibility of different solutions. Participants, working with counsel, determined that such information could be appropriately shared with DAG members pursuant to the provisions of a non-disclosure agreement (“NDA”) that was consistent with the terms of the NDA executed between the Participants and the Bidders. After extensive discussion, DAG members declined to sign such an NDA. The Participants continued to share non-bid specific information and to solicit the views and perspective of DAG members as it developed a Plan approach and related solutions.

Time Stamp Granularity and Clock Synchronization Requirement: Industry Members recommended a millisecond time stamp for electronic order and execution events and a time stamp in seconds for manual order handling. Industry Members suggested a grace period of two years after the CAT requirements are finalized to allow broker-dealers sufficient time to meet the millisecond time stamp granularity. In addition, Industry Members recommended maintaining the current OATS rule of a one second clock drift tolerance for electronic order and execution events, citing a significant burden to Industry Members to comply with a change to the current one-second clock drift.²⁴⁵ Participants conducted active discussions with Industry Members on this topic, and included in the Exemptive Request Letter a request for exemptive relief related to time stamp granularity for Manual Order Events.

Equitable Cost and Funding: Industry Members expressed the view that any funding mechanism developed by the Participants should provide for equitable funding among all market participants, including the Participants. The Participants recognized the importance of this viewpoint and have incorporated it within the guiding principles that were discussed with the Industry.

Order ID/Linkages: The DAG formed an order scenarios working group to discuss approaches to satisfy the order linkage requirements of SEC Rule 613. On the topic of allocations, Industry Members provided feedback that the order and execution processes are handled via front office systems, while allocation processes are conducted in the back office. Industry Members expressed the view that creating linkages between these systems, which currently operate independently, would require extensive reengineering of middle and back office processes not just within a broker-dealer but across broker-dealers, imposing significant additional costs on the industry as a whole. Given the widespread use of average price processing accounts, clearing firms, prime brokers and self-clearing firm cannot always determine which specific order results in a given allocation or allocations. Industry Members worked closely with Participants on a proposed alternative approach which the Participants submitted to the Commission in the Exemptive Request Letters.

Elimination of Systems and Rules: The elimination of duplicative and redundant systems and rules is a critical aspect of the CAT development process. Industry DAG members including SIFMA and FIF provided broad based and comprehensive insight on the list of existing regulatory systems and Participant rules that they deem to be duplicative, including, among others, OATS, the EBS reporting system, and Large Trader reporting. In addition, FIF provided a gap analysis of CAT requirements against Large Trader transactional reporting obligations.

The Participants discussed feedback from the industry in a variety of forums: (i) during DAG meetings; (ii) in relevant Subcommittee meetings, depending on the topic; and (iii) at two multi-day offsite meetings where Representatives of each Participant gathered in a series of in-person workshops to discuss the requirements of the Plan Processor, both technical and operational. This was in addition to numerous video-conference meetings when Participants discussed and developed the RFP document incorporating, where appropriate, feedback from the industry.

²⁴⁵ See FIF Clock Offset Survey Preliminary Report.

12. Discuss Reasonable Alternative Approaches that the Participants Considered to Create, Implement, and Maintain the CAT (SEC Rule 613(a)(1)(xii))

The Participants, working as a consortium, selected the approach reflected in the Plan through a detailed analysis of alternatives, relying on both internal and external knowledge and expertise to collect and evaluate information related to the CAT. For some of the requirements of SEC Rule 613, the Participants' analysis indicated that the required approach would be unduly burdensome or complex. In these cases, the Participants have requested exemption from these requirements in the Exemptive Request Letter, which details the analysis performed and alternatives considered for these specific requirements.

The Participants leveraged their own extensive experience with regulatory, technical and securities issues in formulating, drafting and filing the CAT NMS Plan. Specifically, the nineteen Participants formed various Subcommittees to focus on specific critical issues during the development of the CAT NMS Plan. The Subcommittees included:

- a Governance Committee, which developed recommendations for decision-making protocols and voting criteria critical to the development of the CAT NMS Plan, in addition to developing formal governance and operating structures for the CAT NMS Plan;
- a Technical Committee, which developed the technical scope requirements of the CAT, the CAT RFP documents, and the PPR;
- an Industry Outreach Committee, which provided recommendations on effective methods for soliciting industry input, in addition to facilitating industry involvement in CAT-related public events²⁴⁶ and development of the CAT NMS Plan and the Exemptive Request Letters;
- a Press Committee as a Subcommittee of the Industry Outreach Committee, which coordinated interactions with the press;
- a Cost and Funding Committee, which drafted a framework for determining the costs of the CAT, and provided recommendations on revenue/funding of the CAT for both initial development costs and ongoing costs; and
- an Other Products Committee, which is designed to assist the SEC, as necessary, when the SEC is determining whether and how other products should be added to the CAT.²⁴⁷

Representatives from all Subcommittees met to discuss the overall progress of the CAT initiative in the Operating Committee.

²⁴⁶ A summary of industry outreach events is included in Appendix C, General Industry Solicitation.

²⁴⁷ When adopting the CAT, the Commission directed the Commission staff "to work with the SROs, the CFTC staff, and other regulators and market participants to determine how other asset classes, such as futures, might be added to the consolidated audit trail." Adopting Release at 45744-5 n.241.

To support the Participants' internal expertise, the Participants also engaged outside experts to assist in formulating the CAT NMS Plan. Specifically, the Participants engaged the consulting firm Deloitte & Touche LLP as a project manager, and engaged the law firm Wilmer Cutler Pickering Hale and Dorr LLP to serve as legal counsel in drafting the CAT NMS Plan, both of which have extensive experience with issues raised by the CAT. Additionally, the Participants engaged the services of the public relations firm Peppercomm to assist with public relations and press engagement in formulating the CAT NMS Plan.

Furthermore, as discussed in more detail above in Appendix C, Process by Which Participants Solicited Views of Members and Other Appropriate Parties Regarding Creation, Implementation, and Maintenance of CAT; Summary of Views; and How Sponsors Took Views Into Account in Preparing NMS Plan, the Participants engaged in meaningful dialogue with Industry Members with respect to the development of the CAT through the DAG and other industry outreach events.

Using this internal and external expertise, the Participants developed a process to identify, evaluate and resolve issues so as to finalize the CAT NMS Plan. As discussed above in Appendix C, the Participants have, among other things, developed the Selection Plan to describe the process for selecting the Plan Processor, created and published an RFP, evaluated Bids, and chosen a shortlist of Bids. Contemporaneously, the Participants have drafted the Plan set forth herein to reflect the recommendations that have resulted from the approach and analysis described above.

For certain technical considerations for the development and maintenance of the CAT that do not materially impact cost, required functionality or data security, the Participants did not mandate specific approaches, but rather chose to consider solutions proposed by the Bidders.

(a) Request for Proposal

The Participants considered multiple alternatives for the best approach to gathering the information necessary to determine how to create, implement and maintain the CAT, including issuance of a Request for Information (“RFI”) and Request for Proposal (“RFP”). After due consideration, with a view to meeting the demanding deadline set forth in SEC Rule 613, the Participants decided to use their expertise to craft an RFP seeking proposals to implement the main requirements to successfully build and operate the CAT. This approach was designed to solicit imaginative and competitive proposals from the private sector as well as to provide an adequate amount of insight into the costs associated with creating, implementing, and maintaining the CAT.

To design the RFP process, the Participants consulted with their technology subject matter resources to determine technical implications and requirements of the CAT and to develop the RFP. Based on these requirements, the Participants developed the Proposed RFP Concepts Document,²⁴⁸ which identified the high level requirements for which potential Bidders would be expected to design a solution, ahead of publishing the full RFP on February 26, 2013. The Participants received 31 intents to bid, and then hosted a Bidder conference on March 8, 2013 to discuss the requirements and provide additional context to the industry and potential

²⁴⁸ See *supra* note 11.

Bidders. Two additional conference calls to discuss additional questions on the RFP were held on April 25, 2013 and May 2, 2013. The Participants also established an e-mail box through which questions on the RFP were received.

Ten competitive proposals were submitted on March 21, 2014. Each of the ten proposals was carefully reviewed by the Participants, including in-person meetings with each of the ten Bidders. Following this review, the Bids were reduced to six proposals in accordance with the Selection Plan approved by the Commission in February 2014. In accordance with the Selection Plan Amendment approved by the Commission on June 23, 2015, the Participants asked the Bidders on July 14, 2015 to revise their bids to account for the updated requirements included in the CAT NMS Plan as filed on February 27, 2015, as well as to address specific additional questions and considerations. As described more fully throughout this Appendix C, the proposals offer a variety of solutions for creating, implementing and maintaining the CAT.

As stated above, the Participants received proposals from ten Bidders that were deemed qualified, including many from large and well-respected information technology firms. The open ended nature of the questions contained in the RFP allowed Bidders to provide thoughtful and creative responses with regards to all aspects of the implementation and the operation of the CAT. The RFP process also resulted in the submission of multiple competitively-priced Bids. The six Shortlisted Bids remaining under consideration by the Participants, inclusive of the initial system build and the first five years of maintenance costs, have ranges between \$165 million and \$556 million, and encompass a number of innovative approaches to meeting the requirements of SEC Rule 613, such as use of non-traditional database architectures and cloud-based infrastructure solutions.

The Participants conducted the RFP process and the review of Bids pursuant to the Selection Plan approved by the Commission, which was designed to mitigate the conflicts of interest associated with Participants that are participating in developing the CAT while also seeking to become the Plan Processor and to ensure a level playing field for all potential Bidders to be considered on a fair and equal basis.

(b) Organizational Structure

The Participants considered various organizational structures of the Bidders to assess whether a particular structure would be a material factor in the ability of a Bidder to effectively operate as the Plan Processor. Of the Bids submitted, three general organizational structures for the Plan Processor emerged: (1) consortiums or partnerships (i.e., the Plan Processor would consist of more than one unaffiliated entity that would operate the CAT); (2) single firms (i.e., one entity would be the Plan Processor and that entity would operate the CAT as part of its other ongoing business operations); and (3) dedicated legal entities (i.e., CAT operations would be conducted in a separate legal entity that would perform no other business activities). Each type of organizational structure has strengths and limitations, but the Participants did not find that a particular organizational structure should be a material factor in selecting a Bidder. Accordingly the Participants have not mandated a specific organizational structure for the Plan Processor.

(c) Primary Storage

The Bidders proposed two methods of primary data storage: traditionally-hosted storage architecture, and infrastructure-as-a-service. Traditionally-hosted storage architecture is a model in which an organization would purchase and maintain proprietary servers and other hardware to store CAT Data. Infrastructure-as-a-service is a provisioning model in which an organization outsources the equipment used to support operations, including storage, hardware, servers and networking components to a third party who charges for the service on a usage basis.

Each data storage method has a number of considerations that the Participants will take into account when evaluating each Bidder's proposed solution. Such considerations include the maturity, cost, complexity, and reliability of the data storage method as used in each Bidder's proposal. The Participants are not mandating a specific method for primary data storage provided that the data storage solution can meet the security, reliability, and accessibility requirements for the CAT, including storage of PII data, separately.

(d) Customer and Account Data

All Bidders proposed solutions consistent with the Customer Information Approach in which broker-dealers would report a unique Firm Designated ID for each Customer to the Plan Processor and the Plan Processor would create and store the CAT Customer-ID without passing this information back to the broker-dealer. The use of existing unique identifiers (such as internal firm customer identifiers) could minimize potentially large overhead in the CAT System that otherwise would be required to create and transmit back to CAT Reporters a CAT System-generated unique identifiers. Allowing multiple identifiers also will be more beneficial to CAT Reporters. This approach would still require mapping of identifiers to connect all trading associated with a single Customer across multiple accounts, but it would also ease the burden on CAT Reporters because each CAT Reporter would report information using existing identifiers it currently uses in its internal systems. Moreover, because the CAT System would not be sending a CAT System-generated Customer-ID back to the CAT Reporters, CAT Reporters would not need to process CAT Customer-IDs assigned by the Plan Processor. This approach would reduce the burden on the CAT Reporters because they would not need to build an additional process to receive a Customer-ID and append that identifier to each order origination, receipt or cancellation. This approach may also help alleviate storage and processing costs and potentially reduce the security risk of transmission of the Customer-ID to the CAT Reporter.

The Participants support the use of the Customer Information Approach and included the approach in the Exemptive Request Letter so that the Central Repository could utilize this approach to link Customer and Customer Account Information. The Participants believe this approach would be the most efficient approach for both the Plan Processor and CAT Reporters.

(e) Personally Identifying Information (PII)

All Bidders proposed encrypting all PII, both at rest and in motion. This approach allows for secure storage of PII, even if servers should be compromised or data should be leaked. However, encryption can be highly complex to implement effectively (e.g., the poor choice of password salting or an insecure storage of private keys can compromise security, even without knowledge of the system administrator).

All Bidders also proposed imposing a Role Based Access Control²⁴⁹ to PII. These controls would allow for varying levels of access depending on user needs, and would allow compartmentalizing access based on “need to know.” However, multiple layers of access can add further complexity to the implementation and use of a system.

Some Bidders also proposed implementing multi-factor authentication²⁵⁰. This greatly enhances security and can prevent a leak of passwords or keys from completely compromising security. However, it increases system overhead, and increases the difficulty of accessing data.

The Participants are requiring multi-factor authentication and Role Based Access Control for access to PII, separation of PII from other CAT Data, restricted access to PII (only those with a “need to know” will have access), and an auditable record of all access to PII data contained in the Central Repository. The Participants believe potential increased costs to the Plan Processor and delays that this could cause to accessing PII are balanced by the need to protect PII.

(f) Data Ingestion Format

Bidders proposed several approaches for the ingestion format for CAT Data: uniform defined format, use of existing messaging protocols or a hybrid approach whereby data can be submitted in a uniform defined format or using existing message protocols. There are benefits to the industry under any of the three formats. A large portion of the industry currently reports to OATS in a uniform defined format. These firms have invested time and resources to develop a process for reporting to OATS. The uniform formats recommended by the Bidders would leverage the OATS format and enhance it to meet the requirements of SEC Rule 613. This uniform format, therefore, may reduce the burden on certain CAT Reporters and simplify the process for those CAT Reporters to implement the CAT. However, some firms use message protocols, like FIX, as a standard point of reference with Industry Members that is typically used across the order lifecycle and within a firm’s order management processes. Leveraging existing messaging protocols could result in quicker implementation times and simplify data aggregation for Participants, CAT Reporters, and the Plan Processor, though it is worth noting that message formats may need to be updated to support CAT Data requirements.

The Participants are not mandating the data ingestion format for the CAT. The Participants believe that the nature of the data ingestion is key to the architecture of the CAT. A cost study of members of the Participants did not reveal a strong cost preference for using an existing file format for reporting vs. creating a new format.²⁵¹ However, FIF did indicate there was an industry preference among its members for using the FIX protocol.²⁵²

(g) Process to Develop the CAT

²⁴⁹ Role Based Access Control (RBAC) is a mechanism for authentication in which users are assigned to one or many roles, and each role is assigned a defined set of permissions. Additional details are provided in Appendix D, Data Security.

²⁵⁰ Multifactor authentication is a mechanism that requires the user to provide more than one factor (e.g., biometrics/ personal information in addition to a password) in order to be validated by the system.

²⁵¹ See Appendix C, Analysis of the CAT NMS Plan, for additional details on cost studies.

²⁵² See FIF Response.

Bidders proposed several processes for development of the CAT: the agile or iterative development model, the waterfall model, and hybrid models that incorporate aspects of both the waterfall and agile methodologies. An agile methodology is an iterative model in which development is staggered and provides for continuous evolution of requirements and solutions. A waterfall model is a sequential process of software development with dedicated phases for Conception, Initiation, Analysis, Design, Construction, Testing, Production/ Implementation and Maintenance. The agile or iterative model is flexible to changes and facilitates early delivery of usable software that can be used for testing and feedback, helping to facilitate software that meets users' needs. However, at the beginning of an agile or iterative development process, it can be difficult to accurately estimate the effort and time required for completion. The waterfall model would provide an up-front estimate of time and effort and would facilitate longer-term planning and coordination among multiple vendors or project streams. However, the waterfall model could be less flexible to changes, particularly changes that occur between design and delivery (and thereby potentially producing software that meets specifications but not user needs).

The Participants are not mandating a development process. The Participants believe that either agile or iterative development or waterfall method or even a combination of both methods could be utilized to manage the development of CAT.

(h) Industry Testing

Bidders also proposed a range of approaches to industry testing, including dedicated environments, re-use of existing environments, scheduled testing events, and ongoing testing.

Dedicated industry test environments could provide the possibility of continuous testing by participants, rather than allow for testing only on scheduled dates. Use of dedicated industry test environments also would not impact other ongoing operations (such as disaster recovery sites). However, developing and maintaining dedicated test environments would entail additional complexity and expense. Such expenses may be highest in hosted architecture systems where dedicated hardware would be needed, but potentially rarely used.

The re-use of existing environments, such as disaster recovery environment, would provide simplicity and lower administrative costs. However, it could impact other ongoing operations, such as disaster recovery.

Scheduled testing events (which might be held, for example, on weekends only, or on specific dates throughout the year) could provide for more realistic testing by involving multiple market participants. This approach also would not require the test environment to be available at all times. However, scheduled events would not allow users to test on the CAT System until a dedicated time window is open.

Ongoing testing would allow users to test the CAT System as often as needed. However, this approach would require the test environment to be available at all times. It also may lead to lower levels of test participation at any given time, which may lead to less realistic testing.

The Participants are requiring that the CAT provide a dedicated test environment that is functionally equivalent to the production environment and available on a 24x6 basis. The

Participants believe that an ongoing testing model will be more helpful to the industry because it will provide an environment in which to test any internal system changes or updates that may occur in the course of their business that may affect reporting to the CAT. Additionally, this environment will provide a resource through which the CAT Reporters can continually test any CAT System mandated or rule associated changes to identify and reduce data errors prior to the changes being implemented in the production environment.

(i) Quality Assurance (QA)

The Participants considered a number of QA approaches and methodologies, informed by the Bidder's proposals as well as discussions with the Participants' own subject matter resources. Some of the approaches considered included "continuous integration," where developer working copies are merged into the master and tested several times a day, test automation, and various industry standards such as ISO 20000/ITIL. The Participants are not mandating a single approach to QA beyond the requirements detailed in the RFP, for which each Bidder provided a detailed approach.

One key component of the QA approaches proposed by the Bidders was the staffing levels associated with QA. Initial QA proposals from Bidders included staffing ranges from between 2 and 90 FTEs, although some Bidders indicated that their QA function was directly incorporated into their development function. Some Bidders proposed allocating QA resources after the third month. A larger number of QA resources may facilitate structured, in-depth testing and validation of the CAT System. However, a larger set of QA resources could lead to higher fixed costs and administrative overhead.

The Participants are not mandating the size for QA staffing; however, the Participants will consider each Bidder's QA staffing proposals in the context of the overall Bid, and the selected Bidder must ensure that its QA staffing is sufficient to perform the activities required by the CAT NMS Plan. The Participants believe the QA staffing numbers varied in the Bids because they are largely dependent on both the staffing philosophy of the Bidder as well as the organizational structure for the proposed Central Repository.

(j) User Support and Help Desk

The RFP required that the CAT Help Desk be available on a 24x7 basis, and that it be able to manage 2,500 calls per month. To comply with these requirements, Bidders proposed user support staffing ranges from five to 36 FTEs. They also proposed dedicated support teams and support teams shared with other groups.

A larger number of FTE user support staff could provide a higher level and quality of support. However, a higher number of staff would impose additional overhead and administrative costs. Additionally, as the support organization grows, it may become less closely integrated with the development team, which could decrease support effectiveness.

A dedicated CAT support team would facilitate deep knowledge of the CAT System and industry practices. However, it would create additional overhead and costs. Additionally, management of support teams may not be the managing firm's primary business, which could lead to inefficiencies. A support staff shared with non-CAT teams could provide for increased

efficiency, if the team has greater experience in support more broadly. However, support resources may not have the depth of knowledge that dedicated support teams could be expected to develop.

The Participants are not requiring specific FTEs for user support staffing; however, the Participants will consider each Bidder's user support staffing proposals in the context of the overall Bid, and the selected Bidder must ensure that its staffing is sufficient to perform the activities required by the CAT NMS Plan. The Participants believe that the number of FTEs varied in the Bids because they are largely dependent on both the staffing philosophy of the Bidder as well as the organizational structure for the proposed Central Repository.

Some Bidders proposed a US-based help desk, while others proposed basing it offshore. A U.S.-based help desk could facilitate a higher level of service, and could provide a greater level of security (given the sensitive nature of the CAT). However, a U.S.-based help desk may have greater labor costs. An offshore help desk would potentially have lower labor costs, but could provide (actual or perceived) lower level of service, and could raise security concerns (particularly where the help desk resources are employed by a third-party).

The Participants are not requiring a specific location for the help desk. The Participants believe that as long as the Bidder's solution meets the service and security requirements of the CAT, it is not necessary to prescribe the location.

(k) CAT User Management

Bidders proposed several approaches to user management²⁵³: help desk creation of user accounts, user (e.g., broker-dealer) creation of accounts, and multi-role. Help desk creation of accounts would allow for greater oversight and validation of user creation. However, it would increase administrative costs, particularly in the early stages of the CAT (as an FTE must setup each user). User creation of accounts would require lower staffing levels but would provide less oversight and validation of user creation.

A multi-role approach would allow for a blended approach in which the Plan Processor could, for example, set up an administrator at each broker-dealer, and then allow the broker-dealer to set up additional accounts as needed. This approach could allow users with different levels of access to be provisioned differently, with those requiring greater oversight being provisioned manually. However, it would add complexity to the user creation system, and would provide less oversight and validation than would a fully manual system.

For CAT Reporters entering information into the CAT, the Participants are requiring that each user be validated by the Plan Processor to set-up access to the system. However, for staff at regulators that will be accessing the information for regulatory purposes only, the Plan Processor can establish a set-up administrator who has the ability to provide access to other users within its organization. However, such administrators cannot set up access for PII information. Staff at regulators who need access to PII information must go through an authentication process directly with the Plan Processor. The Participants believe that this approach balances the demand on the

²⁵³ User management is a business function that grants, controls, and maintains user access to a system.

staff at the Plan Processor with the need to ensure proper oversight and validation for users of the CAT.

(l) Required Reportable Order Events

The Participants considered multiple order event types for inclusion in the Plan. Of the order event types considered, the results order event type and the CAT feedback order event were not required. The Participants determined that a results order event type would not provide additional value over a “daisy chain” linkage method. A CAT feedback order event can be generated by the Plan Processor, thereby removing the reporting burden from reporting firms. Therefore the Participants are not requiring CAT Reporters to provide data for these two event types to the CAT. The required reportable order events are listed in Section 6.3(d).

(m) Data Retention Requirements

SEC Rule 613(e)(8) requires data to be available and searchable for a period of not less than five years. Broker-dealers are currently required to retain data for six years under the Exchange Act Rule 17a-4(a).

The Participants support the use of a six year retention timeframe as it complies with Exchange Act Rule 17a-4(a). The Participants are requiring data for six years to be kept online in an easily accessible format to enable regulators to have access to six years of audit trail materials for purposes of its regulation.

The Participants understand that requiring this sixth year of data storage may increase the cost to run the CAT; however, they believe the incremental cost would be outweighed by the needs of regulators to have access to the information. An analysis of the six Shortlisted Bidder proposals indicated that the average expected year-on-year annual cost increase during years four and five (i.e., once all reporters were reporting to the Central Repository) was approximately 4%. Extending this increase to another year would result in incremental annual costs to the Plan Processor ranging from approximately \$1.15 million to \$4.44 million depending upon the Bidder. Based on the assumption that the cumulative annual cost increase from year five to year six will also be 4% (including all the components provided by the Bidders in their respective cost schedules²⁵⁴), the maximum cost increase for data retention for an additional year would be 4%.

(n) Data Feed Connectivity

Bidders proposed either real-time SIP connectivity or end-of-day batch SIP connectivity. Real-time SIP connectivity would provide for more rapid access to SIP Data, but may require additional processing support to deal with out-of-sequence or missing records. End-of-day batch SIP connectivity provides the possibility of simpler implementation, but data from SIPs would not be available in the CAT until after overnight processing. Because CAT Reporters are only required to report order information on a next-day basis, the Participants are not requiring that the Plan Processor have real-time SIP connectivity.

²⁵⁴ RFP at 57.

(o) Disaster Recovery

Participants discussed two commonly accepted structures for disaster recovery: hot-hot²⁵⁵ and hot-warm²⁵⁶. While hot-hot allows for immediate cutover, the Participants agreed that real-time synchronization was not required, but rather that data must be kept synchronized to satisfy disaster recovery timing requirements (e.g., 48 hour cutover). A hot-warm structure meets the requirements of SEC Rule 613, and costs for hot-hot were considered to be higher than hot-warm. Therefore, the Participants are requiring a hot-warm disaster recovery structure, provided it meets the requirements set forth in Appendix D, BCP / DR Process.

(p) Synchronization of Business Clocks

The Participants considered multiple levels of precision for the clock synchronization standard set forth in the plan, ranging from 1 second (s) to 100 microseconds (μ s). The Participants determined based on their expertise and feedback from industry that an initial clock synchronization of 50 milliseconds (ms) would be the most practical and effective choice and represents the current industry standard. Pursuant to SEC Rule 613(d), the initial standard of 50ms will be subject to annual analysis as to whether or not a more stringent clock synchronization tolerance could be implemented consistent with changes in industry standards.

In order to identify the industry standard the Participants and Industry Members reviewed their own internal technology around Network Time Protocol (“NTP”) and Precision Time Protocol (“PTP”),²⁵⁷ potentially used in conjunction with Global Positioning System (“GPS”).²⁵⁸ In reviewing internal infrastructure, the Participants and Industry Members noted that the majority of firms had indicated that they leveraged at least NTP clock synchronization technology. In addition, the FIF conducted a clock synchronization survey²⁵⁹ (“FIF Clock Offset Survey”) of 28 firms to identify costs and challenges associated with clock synchronization tolerances of 50ms, 5ms, 1ms, and 100 μ s. The FIF Clock Offset Survey indicated that 93% of responding firms leverage NTP technology, while fewer than half of responding firms use SNTP, PTP, or GPS. In reviewing the standards for NTP technology, the Participants determined that this technology can accommodate a 50ms tolerance. In addition, the FIF Clock Offset Survey demonstrated that 60% of responding firms currently synchronize their clocks with an offset of 50ms or greater, with approximately 20% of responding firms currently using an offset of 50ms. Only 18% of responding firms used a clock offset of 30ms or less. In light of these reviews and the survey data, the Participants concluded that a clock offset of 50ms represents an aggressive, but achievable, industry standard.

In addition to determining current industry clock offset standards used in the industry, the FIF Clock Offset Survey indicated that the costs to survey respondents were as follows:²⁶⁰

²⁵⁵ In a hot-hot disaster recovery design, both the production site as well as the backup site are live, and the backup can be brought online immediately.

²⁵⁶ In a hot-warm disaster recovery design, the backup site is fully equipped with the necessary hardware. In the event of a disaster, the software and data would need to be loaded into the backup site for it to become operational.

²⁵⁷ NTP and PTP are protocols used to synchronize clocks across a computer network.

²⁵⁸ GPS is a radio navigation system that can be used to capture a precise determination of time.

²⁵⁹ FIF Clock Offset Survey Preliminary Report.

²⁶⁰ The Participants consider the estimates provided to be conservative as a majority of the study respondents fell into the category of large broker-dealers.

Proposed Clock Offset	Estimated Implementation Cost (per firm)	Estimated Annual Maintenance Cost (per firm)
50ms	\$554,348	\$313,043
5ms	\$887,500	\$482,609
1ms	\$1,141,667	\$534,783
100µs	\$1,550,000	\$783,333

As indicated in the above table, annual maintenance costs of survey respondents for a 50ms standard would be on average 31% higher than current costs, and would escalate to 102%, 123%, and 242% increases over current maintenance costs as clock synchronization standards move to 5ms, 1ms, and 100µs respectively, indicating that maintenance costs rapidly escalate as clock synchronization standards increase beyond 50ms. Survey respondents also indicated that increasing clock synchronization requirements would require escalating technology changes, including significant hardware changes (such as installation of dedicated GPS or other hardware clocks and network architecture redesign), migration to new time synchronization standards, and widespread upgrades of operating systems and databases currently in use. For example, to achieve a 5ms clock offset would require firms to install GPS clocks in all locations and migrate from NTP to PTP. The Participants believe, based on the FIF Clock Offset Survey, that fewer than half of firms currently leverage GPS technology or PTP for clock synchronization.

As noted in Article VI, Section 6.8, the Participants, working with the Processor’s Chief Compliance Officer, shall annually evaluate and make recommendations as to whether industry standards have evolved such that changes to the clock synchronization standards should be changed. It is the belief of the Participants that, while setting an initial clock synchronization of 5ms lower than 50ms may be achievable, it does not represent current industry standard and there may be challenges with small broker-dealers’ potentially substantial costs. However, once both large and small broker-dealers begin reporting data to the Central Repository, and as increased time synchronization standards become more mature, the Participants will assess the ability to tighten the clock synchronization standards to reflect changes in industry standards in accordance with SEC Rule 613.

(q) Reportable Securities

SEC Rule 613(c)(6) requires NMS Securities to be reported the Central Repository and SEC Rule 613(i) requires the Participants to detail a plan outlining how non-NMS Securities, debt securities, and Primary Market Transactions in equity securities that are not NMS Securities can be reported to the Central Repository in the future. The Participants considered whether to require including OTC Equity Securities, non NMS Securities, in a future phase of the CAT NMS Plan, as contemplated by the Commission in SEC Rule 613, or accelerating their inclusion into the first phase of the Plan. As part of this consideration, Participants weighed heavily the feedback from the DAG and other market participants of the considerations associated with the

two alternatives, and made the determination to include OTC Equities in the requirements under the CAT NMS Plan.

APPENDIX D

CAT NMS Plan Processor Requirements

Appendix D, CAT NMS Plan Processor Requirements, outlines minimum functional and technical requirements established by the Participants of the CAT NMS Plan for the Plan Processor. Given the technical nature of many of these requirements, it is anticipated, as technology evolves, that some may change over time. The Participants recognize that effective oversight of, and a collaborative working relationship with, the Plan Processor will be critical to ensure the CAT achieves its intended purpose, namely enhanced investor protection, in an efficient and cost-effective manner. The Participants also recognize that maintaining the efficiency and cost-effectiveness of the CAT requires flexibility to respond to technological innovations and market changes. For example, these minimum functional and technical requirements allow the Plan Processor flexibility to make certain changes to the Technical Specifications, while limiting others to the Operating Committee, and anticipate agreement between the Operating Committee and the Plan Processor on SLAs relating to, among other things, development, change management, and implementation processes and timelines. Maintaining such flexibility to adapt in these and other areas relating to the development and operation of the CAT is a foundational principle of this Appendix D.

1. Central Repository Requirements

1.1 Technical Architecture Requirements

The Central Repository must be designed and sized to ingest, process, and store large volumes of data. The technical infrastructure needs to be scalable, adaptable to new requirements and operable within a rigorous processing and control environment. As a result, the technical infrastructure will require an environment with significant throughput capabilities, advanced data management services and robust processing architecture.

The technical architecture must be scalable and able to readily expand its capacity to process significant increases in data volumes beyond the baseline capacity. The baseline capacity requirements are defined in this document. Once the CAT NMS Plan is approved, the Operating Committee will define the baseline metrics on an ongoing basis. CAT capacity planning must include SIP, OPRA and exchange capacity and growth forecasts. The initial baseline capacity requirements will be based on twice (2X) the historical peaks for the most recent six years, and the Plan Processor must be prepared to handle peaks in volume that could exceed this baseline for short periods. The SLA(s) will outline details of the technical performance and scalability requirements, and will be specifically targeted to the selected Bidder's solution.

The Central Repository must have the capacity and capability to:

- Ingest and process throughput to meet baseline capacity requirements as well as scalability to meet peak capacity requirements, including staging, loading, speed of processing, and linking of data;

- Accommodate data storage and query compute, such as:
 - Scalable for growth data storage and expansion capability, including but not limited to, resizing of database(s), data redistribution across nodes, and resizing of network bandwidth;
 - Robust processes to seamlessly add capacity without affecting the online operation and performance of the CAT System; and
 - Quantitative methods for measuring, monitoring, and reporting of excess capacity of the solution;
- Satisfy minimum processing standards as described in the CAT RFP and that will be further defined in the SLA(s);
- Adapt to support future technology developments and new requirements (including considerations for anticipated/potential changes to applicable rules and market behavior);
- Handle an extensible architecture that is capable of supporting asset classes beyond the initial scope of NMS Securities and OTC Equity Securities;
- Comply with the clock synchronization standards as set forth in Article VI, Section 6.8; and
- Handle an extensible data model and messaging protocols that are able to support future requirements such as, but not limited to:
 - Expansion of trading hours, including capability and support for 24-hour markets;
 - Sessions for securities;²⁶¹ and
 - New asset classes, such as debt securities or derivative instruments.

1.2 **Technical Environments**

The architecture must include environments for production, development, quality assurance testing, disaster recovery, industry-wide coordinated testing, and individual on-going CAT Reporter testing. The building and introduction of environments available to CAT Reporters may be phased in to align with the following agreed upon implementation milestones:

- **Development environment** – the development environment must be created to build, develop, and maintain enhancements and new requirements. This environment must be separate from those listed below.

²⁶¹ Equity markets currently have morning, primary, and evening sessions. It is possible that over time sessions may cross into the next calendar day.

- Quality assurance environment – a quality assurance (QA) environment must be created to allow simulation and testing of all applications, interfaces, and data integration points contained in the CAT System.
 - The QA environment shall be able to simulate end-to-end production functionality and perform with the same operational characteristics, including processing speed, as the production environment.
 - The QA environment shall support varied types of changes, such as, but not limited to, the following:
 - Application patches;
 - Bug fixes;
 - Operating system upgrades;
 - Introduction of new hardware or software components;
 - New functionality;
 - Network changes;
 - Regression testing of existing functionality;
 - Stress or load testing (simulation of production-level usage); and
 - Recovery and failover.
 - A comprehensive test plan for each build and subsequent releases must be documented.
- Production environment – fully operational environment that supports receipt, ingestion, processing and storage of CAT Data. Backup/disaster recovery components must be included as part of the production environment.
- Industry test environment –
 - The Plan Processor must provide an environment supporting industry testing (test environment) that is functionally equivalent to the production environment, including:
 - End-to-end functionality (e.g., data validation, processing, linkage, error identification, correction and reporting mechanism) from ingestion to output, sized to meet the standards of the production SLA;
 - Performance metrics that mirror the production environment; and
 - Management with the same information security policies applicable to the production environment.
 - The industry test environment must also contain functionality to support industry testing, including:
 - Minimum availability of 24x6;
 - Replica of production data when needed for testing;
 - Data storage sized to meet varying needs, dependent upon scope and test scenarios; and

- Support of two versions of code (current and pending).
- The industry test environment must support the following types of industry testing:
 - Technical upgrades made by the Plan Processor;
 - CAT code releases that impact CAT Reporters;
 - Changes to industry data feeds (e.g., SIP, OPRA, etc.);
 - Industry-wide disaster recovery testing;
 - Individual CAT Reporter and Data Submitter testing of their upgrades against CAT interfaces and functionality; and
 - Multiple, simultaneous CAT Reporter testing.
- The industry test environment must be a discrete environment separate from the production environment.
- The Plan Processor must provide the linkage processing of data submitted during coordinated, scheduled, industry-wide testing. Results of the linkage processes must be communicated back to Participants as well as to the Operating Committee.
- Data from industry testing must be saved for three months. Operational metrics associated with industry testing (including but not limited to testing results, firms who participated, and amount of data reported and linked) must be stored for the same duration as the CAT production data.
- The Plan Processor must provide support for industry testing, including testing procedures, coordination of industry testing, publish notifications, and provide help desk support during industry testing.
- The Participants and the SEC must have access to industry test data.

1.3 Capacity Requirements

System capacity must have the following characteristics.²⁶²

The Central Repository must be:

- Designed such that additional capacity can be quickly and seamlessly integrated while maintaining system access and availability requirements;
- Able to efficiently and effectively handle data ingestion on days with peak and above-peak data submission volumes; and
- Required to maintain and store data for a 6-year sliding window of data. System access and availability requirements must be maintained during the maintenance of

²⁶² References to data sizing refer to raw, uncompressed data and do not account for benefits of compression, overhead of data storage or indices. Data sizing estimates do not include meta-data and are based on delimited, fixed length data sets. The Plan Processor is responsible for calculating its platform capacity capabilities based on its proposed solution. Three years after the finalization of the CAT NMS Plan, when all CAT Reporters submit their data to the Central Repository, the Central Repository must be sized to receive process and load more than 58 billion records per day.

the sliding window. It is expected that the Central Repository will grow to more than 29 petabytes of raw, uncompressed data.

The Plan Processor must:

- Define a capacity planning process to be approved by the Operating Committee, with such process incorporating industry utility capacity metrics; and
- Develop a robust process to add capacity, including both the ability to scale the environment to meet the expected annual increases as well as to rapidly expand the environment should unexpected peaks in data volumes breach the defined capacity baseline. Capacity forecasts from systems, including OPRA, UTP, and CTA, must also be included for capacity planning purposes. This capacity planning process must be approved by the Operating Committee.

1.3.1 Monitoring Capacity Utilization and Performance Optimization

In order to manage the data volume, operational capacity planning must be conducted on a periodic basis. The Plan Processor must submit capacity-planning metrics to the Operating Committee for review to ensure that all parties are aware of the system processing capabilities and changes to assumptions. Changes to assumptions could lead to positive or negative adjustments in the costs charged to CAT Reporters. Reports that capture daily disk space, processing time, amount of data received and linkage completion times must be provided by the Plan Processor to the Operating Committee.

1.4 Data Retention Requirements

The Plan Processor must develop a formal record retention policy and program for the CAT, to be approved by the Operating Committee, which will, at a minimum:

- Contain requirements associated with data retention, maintenance, destruction, and holds;
- Comply with applicable SEC record-keeping requirements;
- Have a record hold program where specific CAT Data can be archived offline for as long as necessary;
- Store and retain both raw data submitted by CAT Reporters and processed data; and
- Make data directly available and searchable electronically without manual intervention for at least six years.

2. Data Management

The Plan Processor must develop data management policies and procedures to govern and manage CAT Data, reference data, and metadata contained in and used by the Central Repository.

The CAT must capture, store, and maintain current and historical reference data information. This master / reference database will include data elements such as, but not limited to, SRO-assigned market participant identifiers, product type, trading unit size, trade / quote minimum price variation, corporate actions, symbology changes, and changes in listings market center. The Plan Processor must support bi-temporal milestones (e.g., Effective Date and as-of-date) of the reference data.

CAT Reporters will submit data to the Central Repository with the listing exchange symbology format. The Central Repository must use the listing exchange symbology format for output of the linked data. Instrument validation must be included in the processing of data submitted by CAT Reporters.

The Central Repository must be able to link instrument data across any time period so that data can be properly displayed and linked regardless of changes to issue symbols or market class. The Plan Processor is required to create and maintain a symbol history and mapping table, as well as to provide a tool that will display a complete issue symbol history that will be accessible to CAT Reporters, Participants and the SEC. In addition, the Plan Processor will be required to create a start-of-day (“SOD”) and end-of-day (“EOD”) CAT reportable list of securities for use by CAT Reporters. This list must be available online and in a machine readable (e.g., .csv) format by 6 a.m. on each Trading Day.

Queries, reports, and searches for data that span dates where there are changes to reference data must automatically include data within the requested date range. For example, if a query is run for a symbol that had three issue symbol changes during the time window of the query parameters, the result set must automatically include data for all three symbols that were in use during the time window of the query.

The Plan Processor must also develop an end-to-end process and framework for technical, business and operational metadata.

2.1 Data Types and Sources

The Plan Processor will be responsible for developing detailed data and interface specifications for data to be submitted by CAT Reporters. These specifications will be contained in the Technical Specifications, the initial version of which will be presented to the Operating Committee for approval. The Technical Specifications must be designed to capture all of the data elements required by SEC Rule 613, as well as other information the Participants determine necessary to facilitate elimination of reporting systems that the CAT may cause to be redundant, such as EBS and OATS. In the future, new data sources such as public news may be added to the specifications.

CAT Reporters and Data Submitters will transmit data in an electronic data format(s) that will be defined by the Plan Processor. The Technical Specifications must include details for connectivity and electronic submission, transmission, retransmission and processing. It is possible that more than one format will be defined to support the various senders throughout the industry.

The Participants anticipate that some broker-dealers will not directly report to the CAT but will rely on other organizations to report on their behalf. However, the CAT will need to have the flexibility to adapt on a timely basis to changes in the number of entities that report CAT Data.

2.2 Data Feed Management

The Plan Processor must monitor and manage incoming and outgoing data feeds for, at a minimum, the following:

- Data files from each CAT Reporter and Data Submitter;
- Files that cover multiple trade dates (e.g., to account for clearing and changes);
- Full and partial file submissions that contain corrections from previously rejected files;
- Full and partial file submissions based on CAT Reporter; and
- Receipt and processing of market data feeds (SIP, OPRA, OCC).

The Plan Processor must also develop a process for detecting, managing, and mitigating duplicate file submissions. It must create and store operational logs of transmissions, success, and failure reasons in order to create reports for CAT Reporters, Participants, and the SEC. Outgoing data feeds must be logged and corresponding metadata elements must be monitored and captured.

2.2.1 Managing connectivity for data feeds (e.g., SIPs, broker-dealers and regulators)

The Plan Processor will be required to ensure that it provides all CAT Reporters with the ability to transmit CAT Data to the Central Repository as required to meet the reporting requirements. The Plan Processor is required to have a robust managed file transfer (“MFT”) tool, including full monitoring, permissioning, auditing, security, high availability,²⁶³ file integrity checks, identification of data transmission failures / errors, transmission performance metrics, multiple transmission protocols, Latency / network bottlenecks or delays, key management, etc. CAT Reporters must also have the ability to conduct manual data entry via a GUI interface or the uploading of a file, subject to a maximum record capacity, which will be defined by the Plan Processor in consultation with the Operating Committee.

3. Reporting and Linkage Requirements

All CAT Data reported to the Central Repository must be processed and assembled to create the complete lifecycle of each Reportable Event. Reportable Events must contain data

²⁶³ To be defined in the SLAs to be agreed to between the Participants and the Plan Processor, as detailed in Appendix D, Functionality of the CAT System.

elements sufficient to ensure the same regulatory coverage currently provided by existing regulatory reporting systems that have been identified as candidates for retirement.

Additionally, the Central Repository must be able to:

- Assign a unique CAT-Reporter-ID to all reports submitted to the system based on sub-identifiers, (e.g., MPIDs, ETPID, trading mnemonic) currently used by CAT Reporters in their order handling and trading processes.
- Handle duplicate sub-identifiers used by members of different Participants to be properly associated with each Participant.
- Generate and associate one or more Customer-IDs with all Reportable Events representing new orders received from a Customer(s) of a CAT Reporter. The Customer-ID(s) will be generated from a Firm Designated ID provided by the CAT Reporter for each such event, which will be included on all new order events.
- Accept time stamps on order events handled electronically to the finest level of granularity captured by CAT Reporters. Additionally, the CAT must be able to expand the time stamp field to accept time stamps to an even finer granularity as trading systems expand to capture time stamps in ever finer granularity. The Plan Processor must normalize all processed date/time CAT Data into a standard time zone/format.

In addition, the data required from CAT Reporters will include all events and data elements required by the Plan Processor in the Technical Specifications to build the:

- Life cycle of an order for defined events within a CAT Reporter;
- Life cycle of an order for defined events intra-CAT Reporter; and
- State of all orders across all CAT Reporters at any point in time.

The Plan Processor must use the “daisy chain approach” to link and create the order lifecycle. In the daisy chain approach, a series of unique order identifiers, assigned to all order events handled by CAT Reporters are linked together by the Central Repository and assigned a single CAT-generated CAT-Order-ID that is associated with each individual order event and used to create the complete lifecycle of an order.

By using the daisy chain approach the Plan Processor must be able to link all related order events from all CAT Reporters involved in the lifecycle of an order. At a minimum, the Central Repository must be able to create the lifecycle between:

- All order events handled within an individual CAT Reporter, including orders routed to internal desks or departments with different functions (e.g., an internal ATS);

- Customer orders to “representative” orders created in firm accounts for the purpose of facilitating a customer order (e.g., linking a customer order handled on a riskless principal basis to the street-side proprietary order);
- Orders routed between broker-dealers;
- Orders routed from broker-dealers to exchanges;
- Orders sent from an exchange to its routing broker-dealer;
- Executed orders and trade reports;
- Various legs of option/equity complex orders; and
- Order events for all equity and option order handling scenarios that are currently or may potentially be used by CAT Reporters, including:
 - Agency route to another broker-dealer or exchange;
 - Riskless principal route to another broker-dealer or exchange capturing within the lifecycle both the customer leg and street side principal leg;
 - Orders routed from one exchange through a routing broker-dealer to a second exchange;
 - Orders worked through an average price account capturing both the individual street side execution(s) and the average price fill to the Customer;
 - Orders aggregated with other orders for further routing and execution capturing both the street side executions for the aggregated order and the fills to each customer order;
 - Complex orders involving one or more options legs and an equity leg, with a linkage between the option and equity legs;
 - Complex orders containing more legs than an exchange’s order management system can accept, causing the original order to be broken into multiple orders;
 - Orders negotiated over the telephone or via a negotiation system;
 - Orders routed on an agency basis to a foreign exchange;
 - Execution of customer order via allocation of shares from a pre-existing principal order;
 - Market maker quotes; and
 - Complex orders involving two or more options legs.

Additionally, the Central Repository must be able to:

- Link each order lifecycle back to the originating Customer;
- Integrate and appropriately link reports representing repairs of original submissions that are rejected by the CAT due to a failure to meet a particular data validation;

- Integrate into the CAT and appropriately link reports representing records that are corrected by a CAT Reporter for the purposes of correcting data errors not identified in the data validation process;
- Assign a single CAT-Order-ID to all events contained within the lifecycle of an order so that regulators can readily identify all events contained therein; and
- Process and link Manual Order Events with the remainder of the associated order lifecycle.

3.1 Timelines for Reporting

CAT Data for the previous Trading Day must be reported to the Central Repository by 8:00 a.m. Eastern Time on the Trading Day following the day the Industry Member receives such data; however, the Plan Processor must accept data prior to that deadline, including intra-day submissions.

3.2 Other Items

The Plan Processor must anticipate and manage order data processing over holidays, early market closures and both anticipated and unanticipated market closures. The Plan Processor must allow and enable entities that are not CAT Reporters (e.g., service bureaus) to report on behalf of CAT Reporters only upon being permissioned by the CAT Reporter, and must develop appropriate tools to facilitate this process.

3.3 Required Data Attributes for Order Records Submitted by CAT Reporters

At a minimum, the Plan Processor must be able to receive the data elements as detailed in the CAT NMS Plan.

4. Data Security

4.1 Overview

SEC Rule 613 requires that the Plan Processor ensure the security and confidentiality of all information reported to and maintained by the CAT in accordance with the policies, procedures and standards in the CAT NMS Plan.

The Plan Processor must have appropriate solutions and controls in place to ensure data confidentiality and security during all communication between CAT Reporters and Data Submitters and the Plan Processor, data extraction, manipulation and transformation, loading to and from the Central Repository and data maintenance by the CAT System. The Plan Processor must address security controls for data retrieval and query reports by Participant and the SEC. The solution must provide appropriate tools, logging, auditing and access controls for all components of the CAT System, such as but not limited to access to the Central Repository, access for CAT Reporters, access to rejected data, processing status and CAT Reporter performance and comparison statistics.

The Plan Processor must provide to the Operating Committee a comprehensive security plan that covers all components of the CAT System, including physical assets and personnel, and the training of all persons who have access to the Central Repository consistent with Article VI, Section 6.1(m). The security plan must be updated annually. The security plan must include an overview of the Plan Processor's network security controls, processes and procedures pertaining to the CAT Systems. Details of the security plan must document how the Plan Processor will protect, monitor and patch the environment; assess it for vulnerabilities as part of a managed process, as well as the process for response to security incidents and reporting of such incidents. The security plan must address physical security controls for corporate, data center, and leased facilities where Central Repository data is transmitted or stored. The Plan Processor must have documented "hardening baselines" for systems that will store, process, or transmit CAT Data or PII data.

4.1.1 Connectivity and Data Transfer

The CAT System(s) must have encrypted internet connectivity. CAT Reporters must connect to the CAT infrastructure using secure methods such as private lines or (for smaller broker-dealers) Virtual Private Network connections over public lines. Remote access to the Central Repository must be limited to authorized Plan Processor staff and must use secure multi-factor authentication that meets or exceeds the Federal Financial Institutions Examination Council ("FFIEC") security guidelines surrounding authentication best practices.²⁶⁴

The CAT databases must be deployed within the network infrastructure so that they are not directly accessible from external end-user networks. If public cloud infrastructures are used, virtual private networking and firewalls/access control lists or equivalent controls such as private network segments or private tenant segmentation must be used to isolate CAT Data from unauthenticated public access.

4.1.2 Data Encryption

All CAT Data must be encrypted at rest and in flight using industry standard best practices (e.g., SSL/TLS) including archival data storage methods such as tape backup. Symmetric key encryption must use a minimum key size of 128 bits or greater (e.g., AES-128), larger keys are preferable. Asymmetric key encryption (e.g., PGP) for exchanging data between Data Submitters and the Central Repository is desirable.

Storage of unencrypted PII data is not permissible. PII encryption methodology must include a secure documented key management strategy such as the use of HSM(s). The Plan Processor must describe how PII encryption is performed and the key management strategy (e.g., AES-256, 3DES).

If public cloud managed services are used that would inherently have access to the data (e.g., BigQuery, S3, Redshift), then the key management surrounding the encryption of that data must be documented (particularly whether the cloud provider manages the keys, or if the Plan

²⁶⁴ Federal Financial Institutions Examination Council, Supplement to Authentication in an Internet Banking Environment (June 22, 2011), *available at* [http://www.ffiiec.gov/pdf/Auth-ITS-Final%206-22-11%20\(FFIEC%20Formatted\).pdf](http://www.ffiiec.gov/pdf/Auth-ITS-Final%206-22-11%20(FFIEC%20Formatted).pdf).

Processor maintains that control). Auditing and real-time monitoring of the service for when cloud provider personnel are able to access/decrypt CAT Data must be documented, as well as a response plan to address instances where unauthorized access to CAT Data is detected. Key management/rotation/revocation strategies and key chain of custody must also be documented in detail.

4.1.3 Data Storage and Environment

Data centers housing CAT Systems (whether public or private) must, at a minimum, be AICPA SOC 2 certified by a qualified third-party auditor that is not an affiliate of any of the Participants or the CAT Processor. The frequency of the audit must be at least once per year.

CAT compute infrastructure may not be commingled with other non-regulatory systems (or tenets, in the case of public cloud infrastructure). Systems hosting the CAT processing for any applications must be segmented from other systems as far as is feasible on a network level (firewalls, security groups, ACL's, VLAN's, authentication proxies/bastion hosts and similar). In the case of systems using inherently shared infrastructure/storage (e.g., public cloud storage services), an encryption/key management/access control strategy that effectively renders the data private must be documented.

The Plan Processor must include penetration testing and an application security code audit by a reputable (and named) third party prior to launch as well as periodically as defined in the SLA(s). Reports of the audit will be provided to the Operating Committee as well as remediation plan for identified issues. The penetration test reviews of the Central Repository's network, firewalls, and development, testing and production systems should help the CAT evaluate the system's security and resiliency in the face of attempted and successful systems intrusions.

4.1.4 Data Access

The Plan Processor must provide an overview of how access to PII and other CAT Data by Plan Processor employees and administrators is restricted. This overview must include items such as, but not limited to, how the Plan Processor will manage access to the systems, internal segmentation, multi-factor authentication, separation of duties, entitlement management, background checks, etc.

The Plan Processor must develop and maintain policies and procedures reasonably designed to prevent, detect, and mitigate the impact of unauthorized access or usage of data in the Central Repository. Such policies and procedures must be approved by the Operating Committee, and should include, at a minimum:

- Information barriers governing access to and usage of data in the Central Repository;
- Monitoring processes to detect unauthorized access to or usage of data in the Central Repository; and
- Escalation procedures in the event that unauthorized access to or usage of data is detected.

A Role Based Access Control (“RBAC”) model must be used to permission user with access to different areas of the CAT System. The CAT System must support an arbitrary number of roles with access to different types of CAT Data, down to the attribute level. The administration and management of roles must be documented. Periodic reports detailing the current list of authorized users and the date of their most recent access must be provided to Participants, the SEC and the Operating Committee. The reports of the Participants and the SEC will include only their respective list of users. The Participants must provide a response to the report confirming that the list of users is accurate. The required frequency of this report will be defined by the Operating Committee. The Plan Processor must log every instance of access to Central Repository data by users.

Passwords stored in the CAT System must be stored according to industry best practices. Reasonable password complexity rules should be documented and enforced, such as, but not limited to, mandatory periodic password changes and prohibitions on the reuse of the recently used passwords.

Password recovery mechanisms must provide a secure channel for password reset, such as emailing a one-time, time-limited login token to a pre-determined email address associated with that user. Password recovery mechanisms that allow in-place changes or email the actual forgotten password are not permitted.

Any login to the system that is able to access PII data must follow non-PII password rules and must be further secured via multi-factor authentication (“MFA”). The implementation of MFA must be documented by the Plan Processor. MFA authentication capability for all logins is required to be implemented by the Plan Processor.

4.1.5 Breach Management

The Plan Processor must develop policies and procedures governing its responses to systems or data breaches. Such policies and procedures will include a formal cyber incident response plan, and documentation of all information relevant to breaches.

The cyber incident response plan will provide guidance and direction during security incidents. The plan will be subject to approval by the Operating Committee. The plan may include items such as:

- Guidance on crisis communications;
- Security and forensic procedures;
- Customer notifications;
- “Playbook” or quick reference guides that allow responders quick access to key information;
- Insurance against security breaches;

- Retention of legal counsel with data privacy and protection expertise; and
- Retention of a Public Relations firm to manage media coverage.

Documentation of information relevant to breaches should include:

- A chronological timeline of events from the breach throughout the duration of the investigation;
- Relevant information related to the breach (e.g., date discovered, who made the discovery, and details of the breach);
- Response efforts, involvement of third parties, summary of meetings/conference calls, and communication; and
- The impact of the breach, including an assessment of data accessed during the breach and impact on CAT Reporters.

4.1.6 PII Data Requirements

PII data must not be included in the result set(s) from online or direct query tools, reports or bulk data extraction. Instead, results will display existing non-PII unique identifiers (e.g., Customer-ID or Firm Designated ID). The PII corresponding to these identifiers can be gathered using the PII workflow described in Appendix D, Data Security, PII Data Requirements. By default, users entitled to query CAT Data are not authorized for PII access. The process by which someone becomes entitled for PII access, and how they then go about accessing PII data, must be documented by the Plan Processor. The chief regulatory officer, or other such designated officer or employee at each Participant must, at least annually, review and certify that people with PII access have the appropriate level of access for their role.

Using the RBAC model described above, access to PII data shall be configured at the PII attribute level, following the “least privileged” practice of limiting access as much as possible.

PII data must be stored separately from other CAT Data. It cannot be stored with the transactional CAT Data, and it must not be accessible from public internet connectivity. A full audit trail of PII access (who accessed what data, and when) must be maintained. The Chief Compliance Officer and the Chief Information Security Officer shall have access to daily PII reports that list all users who are entitled for PII access, as well as the audit trail of all PII access that has occurred for the day being reported on.

4.2 Industry Standards

The following industry standards—which is not intended to be an exclusive list—must be followed as such standards and requirements may be replaced by successor publications, or modified, amended, or supplemented and as approved by the Operating Committee (in the event of a conflict between standards, the more stringent standard shall apply, subject to the approval of the Operating Committee):

- National Institute of Standards and Technology:
 - 800-23 – Guidelines to Federal Organizations on Security Assurance and Acquisition / Use of Test/Evaluated Products
 - 800-53 – Security and Privacy Controls for Federal Information Systems and Organizations
 - 800-115 – Technical Guide to Information Security Testing and Assessment
 - 800-118 – Guide to Enterprise Password Management
 - 800-133 – Recommendation for Cryptographic Key Generation
 - 800-137 – Information Security Continuous Monitoring for Federal Information Systems and Organizations
 - To the extent not specified above, all other provisions of the NIST Cyber Security Framework
- Federal Financial Institutions Examination Council:
 - Authentication Best Practices
- International Organization for Standardization:
 - ISO/IEC 27001 – Information Security Management

The Company shall endeavor to join the FS-ISAC and comparable bodies as the Operating Committee may determine. The FS-ISAC provides real time security updates, industry best practices, threat conference calls, xml data feeds and a member contact directory. The FS-ISAC provides the Company with the ability to work with the entire financial industry to collaborate for the purposes of staying up to date with the latest information security activities.

5. BCP / DR Process

5.1 Overview

The Plan Processor must develop and implement disaster recovery (“DR”) and business continuity plans (“BCP”) that are tailored to the specific requirements of the CAT environment, and which must be approved and regularly reviewed by the Operating Committee. The BCP must address the protection of data, service for the data submissions, processing, data access, support functions and operations. In the context of this document, BCP generally refers to how the business activities will continue in the event of a widespread disruption and the DR requirements refer to how the CAT infrastructure will be designed to support a full data center outage. In addition, the Plan Processor must have SLAs in place to govern redundancy (i.e., no single point of failure) of critical aspects of the CAT System (e.g., electrical feeds, network connectivity, redundant processors, storage units, etc.) and must have an architecture to support and meet the SLA requirements. Any SLAs between the Plan Processor and third parties must be approved by the Operating Committee.

5.2 Industry Standards

The following National Institute of Standards and Technology standards, at a minimum, must be followed in association with Disaster Recovery, in each case as such standards and requirements may be replaced by successor publications, or modified, amended, or supplemented and as approved by the Operating Committee:

- 800-34 – Contingency Planning for Federal Information Systems; and
- Specifically, the following sections as minimum requirements for designing and implementing BCP and DR plans:
 - Chapter 3: Information System Contingency Planning Process, which identifies seven steps to use when developing contingency plans;
 - Chapter 4: Information System Contingency Plan Development, which outlines the key elements of a contingency plan;
 - Chapter 5: Technical Contingency Planning Considerations (using the specific sections applicable to the Plan Processor’s systems) which provides considerations specific to different types of technology; and
 - Other sections and the appendices should be taken into consideration as warranted.

In addition, the Plan Processor will need to develop a process to manage and report all breaches.

5.3 Business Continuity Planning

The Plan Processor will design a BCP that supports a continuation of the business activities required of the CAT in the event of a widespread disruption.

With respect to the team supporting CAT business operations, a secondary site must be selected that is capable of housing the critical staff necessary for CAT business operations. The site must be fully equipped to allow for immediate use. The selection of the site must take into account diversity in utility and telecommunications infrastructure as well as the ability for CAT staff to access the site in the event of transit shutdowns, closure of major roadways and other significant disruptions that may affect staff. Planning should consider operational disruption involving significant unavailability of staff.

A bi-annual test of CAT operations where CAT staff operates the facility from the secondary site is required. This will ensure that phone systems, operational tools and other help desk functions all work as expected and the Plan Processor still functions as usual even in the event of a disruption.

CAT operations staff must maintain, and annually test, remote access capabilities to ensure smooth operations during a site un-availability event. Certain critical staff may be required to report directly to the secondary office site. However, an effective telecommuting solution must be in place for all critical CAT operations staff. Furthermore, any telecommuting strategy must require a remote desktop style solution where CAT operations and data consoles

remain at the primary data center and must further ensure that CAT Data may not be downloaded to equipment that is not CAT-owned and compliant with CAT security requirements.

The BCP must identify critical third party dependencies. The Plan Processor will coordinate with critical suppliers regarding their arrangements and involve these parties in tests on an annual basis. Critical third party firms may be required to provide evidence of their BCP capabilities and testing.

The Plan Processor must conduct third party risk assessments at regular intervals to verify that security controls implemented are in accordance with NIST SP 800-53. These risk assessments must include assessment scheduling, questionnaire completion and reporting. The Plan Processor should provide assessment reports to the Operating Committee.

The Plan Processor will develop and annually test a detailed crisis management plan to be invoked following certain agreed disruptive circumstances.

The processing sites for business continuity must adhere to the “Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System.”²⁶⁵

The Plan Processor will conduct an annual Business Continuity Audit using an Independent Auditor approved by the Operating Committee. The Independent Auditor will document all findings in a detailed report provided to the Operating Committee.

5.4 Disaster Recovery Requirements

The Plan Processor will implement a DR capability that will ensure no loss of data and will support the data availability requirements and anticipated volumes of the CAT.

A secondary processing site must be capable of recovery and restoration of services at the secondary site within a minimum of 48 hours, but with the goal of achieving next day recovery after a disaster event. The selection of the secondary site must consider sites with geographic diversity that do not rely on the same utility, telecom and other critical infrastructure services. The processing sites for disaster recovery and business continuity must adhere to the “Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System.”

The secondary site must have the same level of availability / capacity / throughput and security (physical and logical) as the primary site. The requirement implies and expects that fully redundant connectivity between the primary and secondary processing sites be established and fully available. Further, given this recovery window, this connectivity must be used to replicate repositories between the primary and secondary sites. Finally, CAT Reporter and Data Submitter submissions must be replicated to the secondary site for possible replay if recent replications are incomplete. Replication must occur as deliveries complete to ensure that a widespread communications failure will have minimal impact to the state of the secondary site.

²⁶⁵ See Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System (Apr. 8, 2003), available at <http://www.sec.gov/news/studies/34-47638.htm>.

On an annual basis, the Plan Processor must execute an industry DR test, which must include Plan Participants and a critical mass of non-Plan Participant CAT Reporters and Data Submitters. The tests must be structured such that all CAT Reporters and other Data Submitters can upload to the DR site and the data be ingested by the CAT Data loaders. All DR tests are required to realistically reflect the worst-case scenario.

Failover processes must be transparent to CAT Reporters, as well as failback. In the event of a site failover, CAT Reporters must be able to deliver their daily files without changing configuration. This avoids requiring all CAT Reporters to update configurations, which is an error-prone effort.

After a DR event, the primary processing site must be made available as quickly as possible. For short duration DR events, the primary site must be returned to primary within 48 hours after the DR event. Longer duration outages will have differing SLAs. The DR plan must include designs that allow the re-introduction of the primary site or the introduction of a new primary site as the event dictates and an indication of the time required for this re-introduction.

6. Data Availability

6.1 Data Processing

CAT order events must be processed within established timeframes to ensure data can be made available to Participants' regulatory staff and the SEC in a timely manner. The processing timelines start on the day the order event is received by the Central Repository for processing. Most events must be reported to the CAT by 8:00 a.m. Eastern Time the Trading Day after the order event occurred (referred to as transaction date). The processing timeframes below are presented in this context. All events submitted after T+1 (either reported late or submitted later because not all of the information was available) must be processed within these timeframes based on the date they were received.

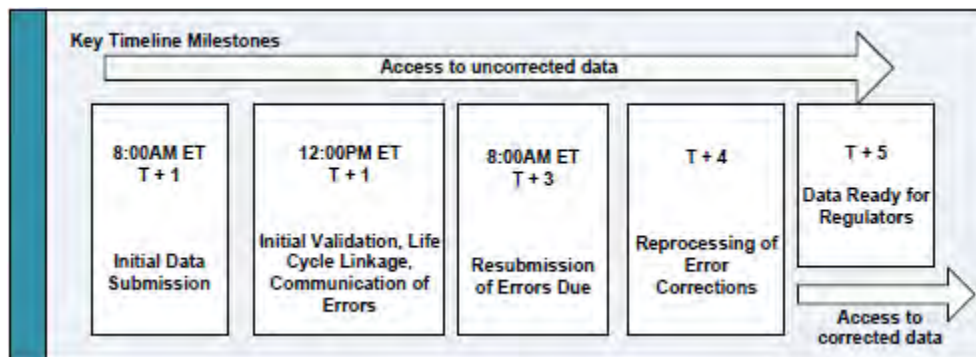
The Participants require the following timeframes (Figure A) for the identification, communication and correction of errors from the time an order event is received by the processor:

- Noon Eastern Time T+1 (transaction date + one day) – Initial data validation, lifecycle linkages and communication of errors to CAT Reporters;
- 8:00 a.m. Eastern Time T+3 (transaction date + three days) – Resubmission of corrected data; and
- 8:00 a.m. Eastern Time T+5 (transaction date + five days) – Corrected data available to Participant regulatory staff and the SEC.

Late submissions or re-submissions (after 8:00 a.m.) may be considered to be processed that day if it falls within a given time period after the cutoff. This threshold will be determined by the Plan Processor and approved by the Operating Committee. In the event that a significant

portion of the data has not been received as monitored by the Plan Processor, the Plan Processor may decide to halt processing pending submission of that data.

Figure A: CAT Central Repository Data Processing Timelines



6.2 Data Availability Requirements

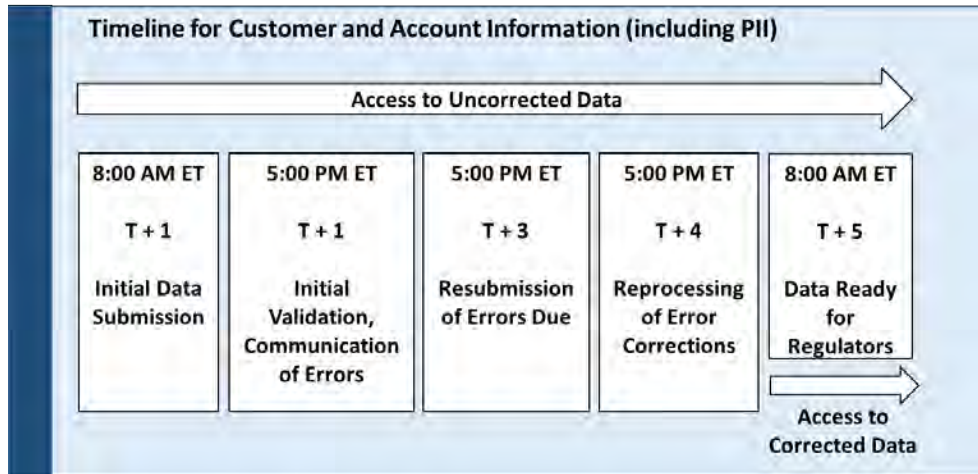
Prior to 12:00 p.m. Eastern Time on T+1, raw unprocessed data that has been ingested by the Plan Processor must be available to Participants' regulatory staff and the SEC.

Between 12:00 p.m. Eastern Time on T+1 and T+5, access to all iterations of processed data must be available to Participants' regulatory staff and the SEC.

The Plan Processor must provide reports and notifications to Participant regulatory staff and the SEC regularly during the five-day process, indicating the completeness of the data and errors. Notice of major errors or missing data must be reported as early in the process as possible. If any data remains un-linked after T+5, it must be available and included with all linked data with an indication that the data was not linked.

If corrections are received after T+5, Participants' regulatory staff and the SEC must be notified and informed as to how re-processing will be completed. The Operating Committee will be involved with decisions on how to re-process the data; however, this does not relieve the Plan Processor of notifying the Participants' regulatory staff and the SEC.

Figure B: Customer and Account Information (Including PII)



CAT PII data must be processed within established timeframes to ensure data can be made available to Participants' regulatory staff and the SEC in a timely manner. Industry Members submitting new or modified Customer information must provide it to the Central Repository no later than 8:00 a.m. Eastern Time on T+1. The Central Repository must validate the data and generate error reports no later than 5:00 p.m. Eastern Time on T+1. The Central Repository must process the resubmitted data no later than 5:00 p.m. Eastern Time on T+4. Corrected data must be resubmitted no later than 5:00 p.m. Eastern Time on T+3. The Central Repository must process the resubmitted data no later than 5:00 p.m. Eastern Time on T+4. Corrected data must be available to regulators no later than 8:00 a.m. Eastern Time on T+5.

Customer information that includes PII data must be available to regulators immediately upon receipt of initial data and corrected data, pursuant to security policies for retrieving PII.

7. Receipt of Data from Reporters

7.1 Receipt of Data Transmission

Following receipt of data files submitted by the CAT Reporter or Data Submitter, the Plan Processor must send an acknowledgement of data received to the CAT Reporter and Data Submitter, if applicable. Such acknowledgment will enable CAT Reporters to create an audit trail of their submissions and allow for tracing of data breakdowns when data is not received. At a minimum, the receipt acknowledgement will include:

- SRO-Assigned Market Participant Identifier;
- Date of Receipt;
- Time of Receipt;
- File Identifier; and

- Value signifying the acknowledgement of receipt, but not processing, of the file.

7.2 Data Validation

The Plan Processor will implement data validations at the file and individual record level for data received by the Plan Processor including customer data. If a record does not pass basic validations, such as syntax rejections, then it must be rejected and sent back to the CAT Reporter as soon as possible, so it can repair and resubmit.²⁶⁶ The required data validations may be amended based on input from the Operating Committee and the Advisory Committee. All identified exceptions will be reported back to the CAT Reporter submitting the data and/or the CAT Reporter on whose behalf the data was submitted.

The data validations must include the following categories and must be explained in the Technical Specifications document:

- File Validations – Confirmation of file transmission and receipt are in the correct formats. This includes validation of header and trailers on the submitted report, confirmation of a valid SRO-Assigned Market Participant Identifier, and verification of the number of records in the file.
- Validation of CAT Data – Syntax and context checks, including:
 - Format checks:
 - Check that the data is entered in the specified format
 - Data Type checks:
 - Check that the data type of each attribute is as per specification
 - Consistency checks:
 - Check that all attributes for a record of a specified type are consistent
 - Range/logic checks:
 - Range check – Validate that each attribute for every record has a value within specified limits
 - Logic check – Validate that the values provided against each attribute are associated with the event type they represent
 - Data validity checks:
 - Validate that each attribute for every record has an acceptable value
 - Completeness checks:
 - Verify that each mandatory attribute for every record is not null
 - Timeliness checks:
 - Verify that records were submitted within the submission timelines

²⁶⁶ If needed – data validation may be a process with an initial validation phase for data errors and a subsequent validation phase later in processing where more time is needed to assess the context of the record in relation to data that may be submitted to the CAT later in the submission window. The Plan Processor must have an additional “matching” process for the purposes of linking together order data passed between CAT Reporters.

- Linkage Validation²⁶⁷ – Process by which related CAT Reportable Events are in a linked daisy chain method

CAT Reporters must have the ability to correct, replace or delete records that have passed initial validations within the CAT.

After the Central Repository has processed the data, the Plan Processor must provide daily statistics, including at a minimum, the following information:

- SRO-Assigned Market Participant Identifier;
- Date of Submission;
- Number of files received;
- Number of files accepted;
- Number of files rejected;
- Number of total order events received;
- Number of order events accepted;
- Number of order events rejected;
- Number of each type of report received;
- Number of each type of report accepted;
- Number of each type of report rejected;
- Number of customer records received;
- Number of total customer records accepted;
- Number of total customer records rejected;
- Number of unknown accounts;
- Number of late submissions;
- Order-IDs rejected;
- Reason(s) for rejection;

²⁶⁷ A linkage validation error should only populate for the CAT Reporter that the Plan Processor determines to have broken the link.

- Number of records attempted to be matched;
- Number of records matched; and
- Percentage of records matched.

Individual records contained in files that do not pass the file validation process must not be included for further processing. Once a file passes the initial validation, individual records contained therein may then be processed for further validation. Individual records that do not pass the data validation processes will not be included in the final audit trail but must be retained. Additionally, records not passing the validations will not be included for matching processes.

7.3 Exception Management

The Plan Processor must capture rejected records for each CAT Reporter and make them available to the CAT Reporter. The “rejects” file must be accessible via an electronic file format and the rejections and daily statistics must be available via a web interface. The Plan Processor must provide functionality for CAT Reporters to amend any exceptions.

The Plan Processor must support bulk error correction. Rejected records can be resubmitted as a new file with appropriate indicators to identify the rejection record, which is being repaired. The Plan Processor will then reprocess repaired records.

A GUI must be available for CAT Reporters to make updates to individual records or attributes and must include, at a minimum, the:

- Count of each type of rejection;
- Reason for each rejection;
- Ability to download the rejections;
- Firm assigned order ID of each rejection;
- Details of each rejection;
- Type of report rejected; and
- Repair status.

The Plan Processor must support bulk replacement of records, and reprocess such replaced records. The Plan Processor must provide CAT Reporters with documentation that detail the process how to amend and upload records that fail the validations that are outlined as part of Section 7.4. The Plan Processor must maintain a detailed audit trail capturing corrections to and replacements of records.

The Plan Processor will provide CAT Reporters with their error reports as they become available, and daily statistics will be provided after data has been uploaded and validated by the

Plan Processor. The Plan Processor must support a continuous validation and feedback model so that CAT Reporters can identify and correct rejections on an ongoing basis. The rejected reports will include descriptive details, or codes related to descriptive details, as to why each data record was rejected by the Plan Processor.

On a monthly basis, the Plan Processor must produce and publish reports detailing performance and comparison statistics for CAT Reporters,²⁶⁸ similar to the Report Cards published for OATS presently. This will enable CAT Reporters to assess their performance in relation to their industry peers and help them assess the risk related to their reporting of transmitted data.

Breaks in intermittent lifecycle linkages must not cause the entire lifecycle to break nor cause a reject to the CAT Reporter that correctly reported.

7.4 Error Corrections

Error corrections must be able to be submitted and processed at any time, including timeframes after the standard repair window. Additionally, in order to make corrections, CAT Reporters must have access to the Central Repository over weekends.

CAT Reporters must be able to submit error corrections for data errors identified by CAT Reporters that passed format validations.

Additionally, the Plan Processor must:

- Provide feedback as to the reason(s) for errors;
- Prevent a linkage break between reports from resulting in additional events being rejected;
- Allow broken linkages to be repaired without having to submit or resubmit additional reports;
- Allow error corrections to be submitted both via online and bulk uploads or via file submission;
- Support auto-correction of identified errors and notify reporters of any auto-corrections;
- Support group repairs (i.e., the wrong issue symbol affecting multiple reports).

7.5 Data Ingestion

Data submitted to the Central Repository, including rejections and corrections, must be stored in repositories designed to hold information based on the classification of the CAT Reporter (i.e., whether the CAT Reporter is a Participant, a broker-dealer, or a third party Data

²⁶⁸ See Appendix C, Error Communication, Correction, and Processing.

Submitter). After ingestion by the Central Repository, the Raw Data must be transformed into a format appropriate for data querying and regulatory output.

8. Functionality of the CAT System

8.1 Regulator Access

The Plan Processor must provide Participants' regulatory staff and the SEC with access to all CAT Data for regulatory purposes only. Participants' regulatory staff and the SEC will access CAT Data to perform functions, including economic analyses, market structure analyses, market surveillance, investigations, and examinations.

The CAT must be able to support, at a minimum, 3,000 regulatory users within the system. It is estimated that approximately 20% of all users will use the system on a daily or weekly basis while approximately 10% of all users will require advanced regulator-user access, as described below. Furthermore, it is estimated that there may be approximately 600 concurrent users accessing the CAT at any given point in time. These users must be able to access and use the system without an unacceptable decline in system performance.²⁶⁹

As stated in Appendix D, Data Security, the Plan Processor must be able to support an arbitrary number of user roles. Defined roles must include, at a minimum:

- Basic regulator users – Individuals with approved access who plan to use the Central Repository to run basic queries (e.g., pulling all trades in a single stock by a specific party).
- Advanced regulator users – Individuals with approved access who plan to use the Central Repository to construct and run their own complex queries.

Regulators will have access to processed CAT Data through two different methods, an online-targeted query tool and user-defined direct queries and bulk extracts.

8.1.1 Online Targeted Query Tool

The online targeted query tool will provide authorized users with the ability to retrieve processed and/or validated (unlinked) data via an online query screen that includes the ability to choose from a variety of pre-defined selection criteria. Targeted queries must include date(s) and/or time range(s), as well as one or more of a variety of fields, including the following:

- Instrument(s);
- Related instruments (e.g., single stock and all options with for the stock);
- Data type (executions, orders, cancelations, quotes, etc.);

²⁶⁹ Specific performance requirements will be included in the SLA.

- Product type (equity, option, etc.);
- Processed data, unlinked data or both;
- Listing market;
- Exchange;
- CAT-Reporter-ID(s) – CAT assigned and Participant assigned;
- Customer-ID(s) – CAT assigned and CAT Reporter assigned;
- CAT-Order-ID(s) – CAT assigned and CAT Reporter assigned;
- ISO flag;
- Put/call;
- Strike price (include ability to select range);
- Size;
- Price;
- Side;
- Short-sale identifier;
- Time-in-force (IOC, GTC, etc.);
- Orders, quotes, BBOs or trades above or below a certain size;
- Orders, quotes, BBOs or trades within a range of prices;
- Canceled orders and/or trades;
- CAT Reporters exceeding specified volume or percentage of volume thresholds in a single instrument or market-wide during a specified period of time;
- CAT Reporter correction rate over time;
- Audit trail of order linkages;
- Corporate action events;
- Instrument history; and
- Others to be defined.

The tool must provide a record count of the result set, the date and time the query request is submitted, and the date and time the result set is provided to the users. In addition, the tool must indicate in the search results whether the retrieved data was linked or unlinked (e.g., using a flag). In addition, the online targeted query tool must not display any PII data. Instead, it will display existing non-PII unique identifiers (e.g., Customer-ID or Firm Designated ID). The PII corresponding to these identifiers can be gathered using the PII workflow described in Appendix D, Data Security, PII Data Requirements. The Plan Processor must define the maximum number of records that can be viewed in the online tool as well as the maximum number of records that can be downloaded. Users must have the ability to download the results to .csv, .txt, and other formats, as applicable. These files will also need to be available in a compressed format (e.g., .zip, .gz). Result sets that exceed the maximum viewable or download limits must return to users a message informing them of the size of the result set and the option to choose to have the result set returned via an alternate method.

The Plan Processor must define a maximum number of records that the online targeted query tool is able to process. The minimum number of records that the online targeted query tool is able to process is 5,000 (if viewed within the online query tool) or 10,000 (if viewed via a downloadable file).

Once query results are available for download, users are to be given the total file size of the result set and an option to download the results in a single or multiple file(s). Users that select the multiple file option will be required to define the maximum file size of the downloadable files. The application will then provide users with the ability to download the files. This functionality is provided to address limitations of end-user network environment that may occur when downloading large files.

The tool must log submitted queries and parameters used in the query, the user ID of the submitter, the date and time of the submission, as well as the delivery of results. The Plan Processor will use this logged information to provide monthly reports to each Participant and the SEC of its respective metrics on query performance and data usage of the online query tool. The Operating Committee must receive all monthly reports in order to review items, including user usage and system processing performance.

8.1.2 Online Targeted Query Tool Performance Requirements

For targeted search criteria, the minimum acceptable response times will be increments of less than one minute. For the complex queries that either scan large volumes of data (e.g., multiple trade dates) or return large result sets (>1M records), the response time must generally be available within 24 hours of the submission of the request. Regardless of the complexity of the criteria used within the online query tool, any query request for data within one business date of a 12-month period must return results within 3 hours.

Performance requirements listed below apply to data:

- Online targeted query tool searches that include equities and options trade data only in the search criteria must meet minimum requirements, including:

- o Returning results within 1 minute for all trades and related lifecycle events for a specific Customer or CAT Reporter with the ability to filter by security and time range for a specified time window up to and including an entire day;
 - o Returning results within 30 minutes for all trades and related lifecycle events for a specific Customer or CAT Reporter in a specified date range (maximum 1 month);
 - o Returning results within 6 hours for all trades and related lifecycle events for a specific Customer or CAT Reporter in a specified date range (maximum 12-month duration from the most recent 24 months); and
 - o Returning results for the full 6 years of data for all trades and lifecycle events across daily, weekly, and multi-year periods.

- Online targeted query tool searches that include equities and options order and National Best Bid and National Best Offer data in search criteria must meet minimum requirements, including:
 - o Returning results within 5 minutes for all orders and their complete lifecycles for a single security from a specific Participant across all markets (note: a Participant could have multiple participant identifiers) in a specified time window not to exceed 10 minutes for a single date;
 - o Returning results within 5 minutes for all orders, cancelations, and the National Best Bid and National Best Offer (or the protected best bid and offer) at the time the order is created for a single security in a specified time window not to exceed 10 minutes for a single date;
 - o Returning results within 5 minutes for all equity and options orders, cancelations, and executions from a specific market participant in a single underlying instrument in a specified time window not to exceed 10 minutes for a single date;
 - o Returning results within 5 minutes for all orders, quotes, routes, cancelations and trades (complete life-cycle) for related instruments (e.g., single stock and all options series for the same stock) in a specified time window not to exceed 10 minutes for a single date;
 - o Returning results within 5 minutes for all orders and quotes entered during a specific time period by a list of specific CAT Reporters, with the ability to drill down to show the complete life-cycle must return results in a specified time window not to exceed 10 minutes for a single date; and
 - o Returning results within 5 minutes for all orders and quotes entered during a specific time period for a specified list of instruments must return results in a specified time window not to exceed 10 minutes for a single date.

The online targeted query tool architecture must include an automated application-level resource management component. This feature must manage query requests to balance the workload to ensure the response times for targeted and complex queries meet the defined response times. The resource management function will categorize and prioritize query requests based on the input parameters, complexity of the query, and the volume of data to be parsed in the query. Additionally, the source of the query may also be used to prioritize the processing.

The Plan Processor must provide details on the prioritization plan of the defined solution for online query requests.

The online targeted query tool must support parallel processing of queries. At a minimum, the online targeted query tool must be able to process up to 300 simultaneous query requests with no performance degradation.

8.1.3 Online Targeted Query Tool Access and Administration

Access to CAT Data is limited to authorized regulatory users from the Participants and the SEC. Authorized regulators from the Participants and the SEC may access all CAT Data, with the exception of PII data. A subset of the authorized regulators from the Participants and the SEC will have permission to access and view PII data. The Plan Processor must work with the Participants and SEC to implement an administrative and authorization process to provide regulator access. The Plan Processor must have procedures and a process in place to verify the list of active users on a regular basis.

A two-factor authentication is required for access to CAT Data. PII data must not be available via the online targeted query tool or the user-defined direct query interface.

8.2 User-Defined Direct Queries and Bulk Extraction of Data

The Central Repository must provide for direct queries, bulk extraction, and download of data for all regulatory users. Both the user-defined direct queries and bulk extracts will be used by regulators to deliver large sets of data that can then be used in internal surveillance or market analysis applications. The data extracts must use common industry formats.

Direct queries must not return or display PII data. Instead, they will return existing non-PII unique identifiers (e.g., Customer-ID or Firm Designated ID). The PII corresponding to these identifiers can be gathered using the PII workflow described in Appendix D, Data Security, PII Data Requirements.

Participants and regulators must have the ability to create, save, and schedule dynamic queries that will run directly against processed and/or unlinked CAT Data. The examples below demonstrate robust usage of the CAT Data to perform a variety of complex query, surveillance, and market analysis use cases. User-defined direct queries will be used to perform tasks such as market reconstruction, behavioral analysis, and cross-market surveillance.

The method(s) for providing this capability is dependent upon the architecture of the CAT and will be defined by the final solution. The CAT cannot be web-based due to the volumes of data that could be extracted.

The Participants are agnostic as to how user-defined direct queries or bulk extracts are implemented as long as the solution provides an open API that allows regulators to use analytic tools (e.g., R, SAS, Python, Tableau) and can use ODBC/JDBC drivers to access the CAT Data. Queries invoked through the open API must be auditable. The CAT System must contain the same level of control, monitoring, logging and reporting as the online targeted query tool. The Plan Processor may define a limited set of basic required fields (e.g., date and at least one other

field such as symbol, CAT-Reporter ID, or CAT-Customer-ID) that regulators must use in direct dynamic queries.

The Plan Processor must provide procedures and training to regulators that will use the direct query feature. The Plan Processor may choose to require that user-defined direct query users participate in mandatory training sessions.

The bulk extract feature will replace the current Intermarket Surveillance Group (ISG) ECAT and COATS compliance data files that are currently processed and provided to Participants for use in surveillance applications. These files are used extensively across all Participants in a variety of surveillance applications and are a critical data input to many surveillance algorithms. With the initial implementation of the CAT, opportunities exist to improve the content and depth of information available in these data files. The Plan Processor will need to work with ISG to define new layouts that will include additional data elements that will be available in the CAT Data.

The Plan Processor is responsible for providing data models and data dictionaries for all processed and unlinked CAT Data.

8.2.1 User-Defined Direct Query Performance Requirements

The user-defined direct query tool is a controlled component of the production environment made available to allow the Participants' regulatory staff and the SEC to conduct queries. The user-defined direct query tool must:

- Provide industry standard programmatic interface(s) that allows Participants' regulatory staff and the SEC with the ability to create, save, and run a query;
- Provide query results that are extractable / downloadable and can be used to refine subsequent queries;
- Support complex, multistage queries;
- Run at a minimum 3,000 queries on a daily basis. Of these, it is anticipated that roughly 60% would be simple queries (e.g., pulling of all trades in a given symbol traded during a certain time period) and 40% would be complex (e.g., looking for quotes or orders more than 5% away from the National Best Bid and National Best Offer);
- Process and run approximately 1,800 queries concurrently;
- Support SQL 92 as well as recursive queries with common table expressions (recursive CTEs), bulk load utility, interface for dimension management, windowing functions, JBDC and ODBC, or provide another API with equal or greater query capabilities, so long as ODBC and JDBC are supported. Support for stored procedures and user-defined functions are optional;

- Include data presentation tools / query tools that support query results that produce data sets ranging from less than 1 gigabyte to at least 10 terabytes or more of uncompressed data;
- Provide query owners with the ability to schedule queries;
- Provide query owners with the ability to cancel a query during execution or prior to the scheduled running of a query;
- Provide Participants with a means to view all saved queries owned by the Participants as well as the scheduling of query executions (for queries that have been scheduled);
- Provide an automated delivery method of scheduled query results to the appropriate Participant. Delivery methods must comply with all information security guidelines (encryption, etc.);
- Provide technical expertise to assist regulators with questions and/or functionality about the content and structure of the CAT query capability;
- Include workload balancer to allow prioritization and processing of queries and delivery of results; and
- Support parallel processing of queries. At a minimum, the user-defined direct query tool must be able to process up to 300 simultaneous query requests with no performance degradation.

8.2.2 Bulk Extract Performance Requirements

For bulk extracts of an entire day of data, the minimum acceptable transfer time of equity and options data is four hours. This requirement assumes that there are no limitations within the regulator's own network environment that will prevent the Plan Processor from meeting this requirement.

A consideration was made to require an online Report Center that would include pre-canned reports that could be delivered to regulators or pulled upon request. The reports would be predefined based on requirements developed by Participants and the SEC. Due to the added complexity and the lack of quantifiable use cases, the Participants determined that this was something that may be useful in the future but not at the initial implementation and launch of the CAT. This will be reassessed when broker-dealers begin submitting data to the CAT.

It is envisioned that non-Participant CAT Reporters will be unable to access their data submissions through bulk data exports with the initial implementation of CAT. Only Participants and the SEC will have access to full lifecycle corrected bulk data exports.

Extraction of data must be consistently in line with all permissioning rights granted by the Plan Processor. Data returned must be encrypted, password protected and sent via secure

methods of transmission. In addition, PII data must be masked unless users have permission to view the data that has been requested.

The Plan Processor must have an automated mechanism in place to monitor user-defined direct query usage. This monitoring must include automated alerts to notify the Plan Processor of potential issues with bottlenecks or excessively long queues for queries or data extractions. The Plan Processor must provide details as to how the monitoring will be accomplished and the metrics that will be used to trigger alerts.

The user-defined direct query and bulk extraction tool must log submitted queries and parameters used in the query, the user ID of the submitter, the date and time of the submission and the date and time of the delivery of results. The Plan Processor will use this logged information to provide monthly reports to the Operating Committee, Participants and the SEC of their respective usage of the online query tool.

The bulk extract tool must support parallel processing of queries. At a minimum, the bulk extract tool must be able to process up to 300 simultaneous query requests with no performance degradation.

8.3 Identifying Latency and Communicating Latency Warnings to CAT Reporters

The Plan Processor will measure and monitor Latency within the CAT network. Thresholds for acceptable levels of Latency will be identified and presented to the Operating Committee for approval. The Plan Processor will also define policies and procedures for handling and the communication of data feed delays to CAT Reporters, the SEC, and Participants' regulatory staff that occur in the CAT. Any delays will be posted for public consumption, so that CAT Reporters may choose to adjust the submission of their data appropriately, and the Plan Processor will provide approximate timelines for when system processing will be restored to normal operations.

8.4 Technical Operations

The Plan Processor will develop policies, procedures, and tools to monitor and manage the performance of the Central Repository, to be approved by the Operating Committee. Such policies, procedures, and tools will include, at a minimum:

- Monitoring and management of system availability and performance, to include both Online Targeted Query Tool and User-Defined Direct Queries;
- Monitoring and management of query tool usage (e.g., to identify long-running or "stuck" queries); and
- Segregation of query queues by regulator or Participant (i.e., one regulator or Participant's queries should not prevent another regulator or Participant's queries from running).

8.5 System SLAs

Service Level Agreements for system and operational performance will be established for areas, including the following:

- Linkage and order event processing performance;
- Query performance and response times;
- System availability;
- User support/help desk performance;
- Application, network, and data security performance; and
- Development, change management, and implementation processes and timelines.

The actual terms of the SLAs will be negotiated between the Plan Participants and the eventual Plan Processor.

9. CAT Customer and Customer Account Information

9.1 Customer and Customer Account Information Storage

The CAT must capture and store Customer and Customer Account Information in a secure database physically separated from the transactional database. The Plan Processor will maintain information of sufficient detail to uniquely and consistently identify each Customer across all CAT Reporters, and associated accounts from each CAT Reporter. The following attributes, at a minimum, must be captured:

- Social security number (SSN) or Individual Taxpayer Identification Number (ITIN);
- Date of birth;
- Current name;
- Current address;
- Previous name; and
- Previous address.

For legal entities, the CAT must capture the following attributes:

- Legal Entity Identifier (LEI) (if available);
- Tax identifier;
- Full legal name; and

- Address.

The Plan Processor must maintain valid Customer and Customer Account Information for each trading day and provide a method for Participants' regulatory staff and the SEC to easily obtain historical changes to that information (e.g., name changes, address changes, etc.).

The Plan Processor will design and implement a robust data validation process for submitted Firm Designated ID, Customer Account Information and Customer Identifying Information, and must continue to process orders while investigating Customer information mismatches. Validations should:

- Confirm the number of digits on a SSN,
- Confirm date of birth, and
- Accommodate the situation where a single SSN is used by more than one individual.

The Plan Processor will use the Customer information submitted by all broker-dealer CAT Reporters to assign a unique Customer-ID for each Customer. The Customer-ID must be consistent across all broker-dealers that have an account associated with that Customer. This unique CAT-Customer-ID will not be returned to CAT Reporters and will only be used internally by the CAT.

Broker-Dealers will initially submit full account lists for all active accounts to the Plan Processor and subsequently submit updates and changes on a daily basis. In addition, the Plan Processor must have a process to periodically receive full account lists to ensure the completeness and accuracy of the account database. The Central Repository must support account structures that have multiple account owners and associated Customer information (joint accounts, managed accounts, etc.), and must be able to link accounts that move from one CAT Reporter to another (e.g., due to mergers and acquisitions, divestitures, etc.).

9.2 Required Data Attributes for Customer Information Data Submitted by Industry Members

At a minimum, the following Customer information data attributes must be accepted by the Central Repository:

- Account Owner Name;
- Account Owner Mailing Address;
- Account Tax Identifier (SSN, TIN, ITIN);
- Market Identifiers (Larger Trader ID, LEI);
- Type of Account;

- Firm Identifier Number;
 - The number that the CAT Reporter will supply on all orders generated for the Account;
- Prime Broker ID;
- Bank Depository ID; and
- Clearing Broker.

9.3 Customer-ID Tracking

The Plan Processor will assign a CAT-Customer-ID for each unique Customer. The Plan Processor will determine a unique Customer using information such as SSN and DOB for natural persons or entity identifiers for Customers that are not natural persons and will resolve discrepancies. Once a CAT-Customer-ID is assigned, it will be added to each linked (or unlinked) order record for that Customer.

Participants and the SEC must be able to use the unique CAT-Customer-ID to track orders from any Customer or group of Customers, regardless of what brokerage account was used to enter the order.

9.4 Error Resolution for Customer Data

The Plan Processor must design and implement procedures and mechanisms to handle both minor and material inconsistencies in Customer information. The Central Repository needs to be able to accommodate minor data discrepancies such as variations in road name abbreviations in searches. Material inconsistencies such as two different people with the same SSN must be communicated to the submitting CAT Reporters and resolved within the established error correction timeframe as detailed in Section 8.

The Central Repository must have an audit trail showing the resolution of all errors. The audit trail must, at a minimum, include the:

- CAT Reporter submitting the data;
- Initial submission date and time;
- Data in question or the ID of the record in question;
- Reason identified as the source of the issue, such as:
 - duplicate SSN, significantly different Name;
 - duplicate SSN, different DOB;
 - discrepancies in LTID; or
 - others as determined by the Plan Processor;

- Date and time the issue was transmitted to the CAT Reporter, included each time the issue was re-transmitted, if more than once;
- Corrected submission date and time, including each corrected submission if more than one, or the record ID(s) of the corrected data or a flag indicating that the issue was resolved and corrected data was not required; and
- Corrected data, the record ID, or a link to the corrected data.

10. User Support

10.1 CAT Reporter Support

The Plan Processor will provide technical, operational and business support to CAT Reporters for all aspects of reporting. Such support will include, at a minimum:

- Self-help through a web portal;
- Direct support through email and phone;
- Support contact information available through the internet; and
- Direct interface with Industry Members and Data Submitters via industry events and calls, industry group meetings and informational and training sessions.

The Plan Processor must develop tools to allow each CAT Reporter to:

- Monitor its submissions;
- View submitted transactions in a non-bulk format (i.e., non-downloadable) to facilitate error corrections;
- Identify and correct errors;
- Manage Customer and Customer Account Information;
- Monitor its compliance with CAT reporting requirements; and
- Monitor system status.

The Plan Processor will develop and maintain communication protocols (including email messaging) and a secure website to keep CAT Reporters informed as to their current reporting status, as well as issues with the CAT that may impact CAT Reporters' ability to submit or correct data. The website will use user authentication to prevent users for seeing information about firms other than their own, and will contain:

- Daily reporting statistics for each CAT Reporter,²⁷⁰ including items such as:
 - SRO-Assigned Market Participant Identifier;
 - Date of submission;
 - Number of files received;
 - Number of files accepted;
 - Number of files rejected;
 - Number of total order events received;
 - Number of order events accepted;
 - Number of order events rejected;
 - Number of each type of report received;
 - Number of each type of report accepted;
 - Number of each type of report rejected;
 - Number of total customer records accepted;
 - Number of total customer records rejected;
 - Order-IDs rejected;
 - Reason for rejection;
 - Number of records attempted to be matched;
 - Number of records matched;
 - Percentage of records matched;
 - Number of customer records received;
 - Number of unknown accounts;
 - Latest view of statistics inclusive of re-submissions to get a trade-date view of exceptions and correction statistics available for CAT Reporters to know when everything for a given trade date has been completed; and
 - Most recent CAT Reporter Compliance Report Card, as defined in section 12.4;
- CAT System status, system notifications, system maintenance, and system outages; and
- A mechanism for submitting event data and correcting and resubmitting rejections or inaccurate data.

The Plan Processor will develop and maintain a public website containing comprehensive CAT reporting information, including:

- Technical Specifications;
- Reporting guidance (e.g., FAQs);
- Pending rule changes affecting CAT reporting;

²⁷⁰ Each CAT Reporter or Data Submitter must only be able to view its own data and data it submits on behalf of others.

- CAT contact information;
- Availability of test systems;
- Testing plans;
- Proposed changes to the CAT; and
- Fee schedule.

The Plan Processor will develop and maintain a mechanism for assigning CAT Reporter-IDs. A mechanism will also be developed and maintained to change CAT Reporter-IDs should this be necessary (e.g., due to a merger), with the expectations that such changes should be infrequent. Changes to CAT-Reporter-IDs must be reviewed and approved by the Plan Processor.

Initially, non-Participant CAT Reporters will not have access to their data submissions through bulk data exports with the initial implementation of the Central Repository. Only Participants and the SEC will have access to full lifecycle corrected bulk data exports. Non-Participant CAT Reporters will be able to view their submissions online in a read-only, non-exportable format to facilitate error identification and correction. Data Submitters will be able to export bulk file rejections for repair and error correction purposes.

The Plan Processor will define methods by which it will consult with and inform CAT Reporters and industry groups on updates and changes to user support.

The Plan Processor will define pre- and post-production support programs to minimize the Error Rate and help CAT Reporters to meet their compliance thresholds. Such pre-production support program shall include, but are not limited to, the following activities:

- Educational programs – Includes the following:
 - Publication and industry-wide communication (including FAQs) of the Technical Specifications, including:
 - Appropriate definitions / expected usages for each value in field format
 - All available attribute values for each field
 - Establishment of a dedicated help desk for Reporters to contact;
 - Industry participation in order linkage methodologies;
 - Include information on new order / trade types;
 - Hosting of industry educational calls; and
 - Hosting of industry-wide training.

- Registration – Requires all firms to:
 - Register and be certified as CAT Reporters;
 - Attend industry-wide training;
 - Establish internal controls to capture potential misreporting scenarios; and
 - Work with the Plan Processor to understand scenario-based reporting and expected outputs.

- Communications Plan – A strong communications plan of the timeline to reporting go-live shall:
 - Include communication on how Error Rates and Compliance Thresholds are calculated; and
 - Describe how errors will be communicated back to CAT Reporters.

- Industry-wide testing – Industry-wide test results must be available for all CAT Reporters.
 - As mentioned in Appendix C, Objective Milestones to Assess Progress, appropriate time must be provided between Technical Specification publication and production go-live.
 - Ample testing time must be provided.
 - Appropriate scenario-based testing, including all three validation processes, shall be established.
 - A separate test environment for CAT Reporters that mirrors the production environment shall be provided.

Post-production support program activities shall include, but are not limited to the following:

- Issuing a monthly Report Card on reporting statistics, with information on how reporters stand against similar entities;
- Publishing daily reporting statistics;
- Maintaining Technical Specifications with defined intervals for new releases/updates;
- Posting FAQs and other informational notices to be updated as necessary;
- Hosting of industry educational calls;
- Hosting of industry-wide training;
- Emailing outliers, meaning firms significantly reporting outside of industry standards;
- Conducting annual assessments of dedicated help desk to determine appropriate staffing levels;

- Using the test environment prior to releasing new code to production; and
- Imposing CAT Reporter requirements:
 - Attendance/participation of industry testing sessions;
 - Attendance in industry educational calls; and
 - Attendance in industry-wide training.

10.2 CAT User Support

The Plan Processor will develop a program to provide technical, operational and business support to CAT users, including Participants' regulatory staff and the SEC. The CAT help desk will provide technical expertise to assist regulators with questions and/or functionality about the content and structure of the CAT query capability.

The Plan Processor will develop tools, including an interface, to allow users to monitor the status of their queries and/or reports. Such website will show all in-progress queries/reports, as well as the current status and estimated completion time of each query/report.

The Plan Processor will develop communication protocols to notify regulators of CAT System status, outages and other issues that would affect Participants' regulatory staff and the SEC's ability to access, extract, and use CAT Data. At a minimum, Participants' regulatory staff and the SEC must each have access to a secure website where they can monitor CAT System status, receive and track system notifications, and submit and monitor data requests.

The Plan Processor will develop and maintain documentation and other materials as necessary to train regulators in the use of the Central Repository, including documentation on how to build and run reporting queries.

10.3 CAT Help Desk

The Plan Processor will implement and maintain a help desk to support broker-dealers, third party CAT Reporters, and Participant CAT Reporters (the "CAT Help Desk"). The CAT Help Desk will address business questions and issues, as well as technical and operational questions and issues. The CAT Help Desk will also assist Participants' regulatory staff and the SEC with questions and issues regarding obtaining and using CAT Data for regulatory purposes.

The CAT Help Desk must go live within a mutually agreed upon reasonable timeframe after the Plan Processor is selected, and must be available on a 24x7 basis, support both email and phone communication, and be staffed to handle at minimum 2,500 calls per month. Additionally, the CAT Help Desk must be prepared to support an increased call volume at least for the first few years. The Plan Processor must create and maintain a robust electronic tracking system for the CAT Help Desk that must include call logs, incident tracking, issue resolution escalation.

CAT Help Desk support functions must include:

- Setting up new CAT Reporters, including the assignment of CAT-Reporter-IDs and support prior to submitting data to CAT;
- Managing CAT Reporter authentication and entitlements;
- Managing CAT Reporter and third party Data Submitters testing and certification;
- Managing Participants and SEC authentication and entitlements;
- Supporting CAT Reporters with data submissions and data corrections, including submission of Customer and Customer Account Information;
- Coordinating and supporting system testing for CAT Reporters;
- Responding to questions from CAT Reporters about all aspects of CAT reporting, including reporting requirements, technical data transmission questions, potential changes to SEC Rule 613 that may affect the CAT, software/hardware updates and upgrades, entitlements, reporting relationships, and questions about the secure and public websites;
- Responding to questions from Participants' regulatory staff and the SEC about obtaining and using CAT Data for regulatory purposes, including the building and running of queries; and
- Responding to administrative issues from CAT Reporters, such as billing.

10.4 CAT Reporter Compliance

The Plan Processor must include a comprehensive compliance program to monitor CAT Reporters' adherence to SEC Rule 613. The Chief Compliance Officer will oversee this compliance program, and will have responsibility for reporting on compliance by CAT Reporters to the Participants. The compliance program covers all CAT Reporters, including broker-dealers and Participants.

As a fundamental component of this program, the Plan Processor will identify on a daily basis all CAT Reporters exceeding the maximum allowable Error Rate established by the Participants. The Error Rate will initially be set by the CAT NMS Plan, and will be reviewed and adjusted on an ongoing basis by the Operating Committee. Error Rates will be based on timeliness, correctness, and linkages.

The Plan Processor will, on an ongoing basis, analyze reporting statistics and Error Rates and recommend to Participants proposed changes to the maximum allowable Error Rates established by the Participants. All CAT Reporters exceeding this threshold will be notified that they have exceeded the maximum allowable Error Rate and will be informed of the specific reporting requirements that they did not fully meet (e.g., timeliness or rejections).

The Plan Processor will develop and publish CAT Reporter compliance report cards on a periodic basis to assist CAT Reporters in monitoring overall compliance with CAT reporting

requirements. The Plan Processor will also recommend criteria and processes by which CAT Reporters will be fined for inaccurate, incomplete, or late submissions. The compliance report cards will include the following information:

- Number of inaccurate transactions submitted;
- Number of incomplete transactions submitted; and
- Number of transactions submitted later than reporting deadlines.

The CAT Reporter compliance program will include reviews to identify CAT Reporters that may have failed to submit order events to the CAT, as well as to ensure CAT Reporters correct all identified errors even if such errors do not exceed the maximum allowable Compliance Threshold.

The Plan Processor will, on a monthly basis, produce and provide reports containing performance and comparison statistics as needed to each Participant on its members' CAT reporting compliance thresholds so that Participants can monitor their members' compliance with CAT reporting requirements and initiate disciplinary action when appropriate. The Plan Processor will also produce and provide, upon request from the Participants and the SEC, reports containing performance and comparison statistics as needed on each CAT Reporter's compliance thresholds so that the Participants or the SEC may take appropriate action if a Participant fails to comply with its CAT reporting obligations.

The Plan Processor will produce and make available on a monthly basis reports for all CAT Reporters, benchmarking their performance and comparison statistics against similar peers. The reports will be anonymized such that it will not be possible to determine the members of the peer group to which the CAT Reporter was compared.

The Plan Processor will produce and make available to regulators on a monthly basis a report detailing Error Rates, transaction volumes, and other metrics as needed to allow regulators to oversee the quality and integrity of CAT Reporter reporting to the Central Repository.

11. Upgrade Process and Development of New Functionality

11.1 CAT Functional Changes

The Plan Processor must propose a process governing the determination to develop new functionality, which process must be reviewed and approved by the Operating Committee. The process must, at a minimum:

- Contain a mechanism by which changes can be suggested to the Operating Committee by Advisory Committee members, the Participants, or the SEC;
- Contain a defined process for developing impact assessments, including implementation timelines, for proposed changes; and

- Contain a mechanism by which functional changes which the Plan Processor wishes to undertake can be reviewed and approved by the Operating Committee.

The Plan Processor shall not unreasonably withhold, condition, or delay implementation of any changes or modifications reasonably requested by the Operating Committee.

11.2 CAT Infrastructure Changes

The Plan Processor must implement a process to govern changes to CAT. This process must contain provisions for:

- Business-as-usual changes (e.g., replacing failed hardware, adding capacity to deal with expected increases in transaction volumes) that would require the Plan Processor to provide the Operating Committee with a summary report (e.g., infrastructure changes, acquired costs, etc.); and
- Isolated infrastructure changes (e.g., moving components of the system from a self-hosted to an Infrastructure-as-a-Service provider) that would require the Plan Processor to provide a request to the Operating Committee for review and approval before commencing any actions.

11.3 Testing of New Changes

The Plan Processor must implement a process governing user testing of changes to CAT functionality and infrastructure, which process must be reviewed and approved by the Operating Committee. The process must:

- Define the process by which changes are to be tested by CAT Reporters;
- Define the criteria by which changes will be approved prior to their deployment into the production environment(s); and
- Define the environment(s) to be used for user testing.

EXHIBIT 2

SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-90688)

December 16, 2020

Order Granting Temporary Conditional Exemptive Relief Pursuant to Section 36 of the Securities Exchange Act of 1934 (“Exchange Act”) and Rule 608(e) of Regulation NMS Under the Exchange Act, Relating to Certain Requirements of the National Market System Plan Governing the Consolidated Audit Trail

I. Introduction

BOX Exchange LLC, Cboe BYX Exchange, Inc., Cboe BZX Exchange, Inc., Cboe EDGA Exchange, Inc., Cboe EDGX Exchange, Inc., Cboe C2 Exchange, Inc., Cboe Exchange, Inc., Financial Industry Regulatory Authority, Inc., Investors Exchange LLC, MEMX LLC, Miami International Securities Exchange LLC, MIAX Emerald, LLC, MIAX PEARL, LLC, NASDAQ BX, LLC, Nasdaq GEMX, LLC, Nasdaq ISE, LLC, Nasdaq MRX, LLC, NASDAQ PHLX LLC, The NASDAQ Stock Market LLC, New York Stock Exchange LLC, NYSE American LLC, NYSE Arca, Inc., NYSE Chicago, Inc., NYSE National, Inc., and Long Term Stock Exchange, Inc. (collectively, the “Participants” or “SROs”) are responsible for implementing the National Market System Plan Governing the Consolidated Audit Trail (“CAT NMS Plan”).¹ When fully implemented, the consolidated audit trail (“CAT”) is designed to capture customer and order event information for Eligible Securities² across all markets, from the time of order inception through routing, cancellation, modification, or execution in a single, consolidated data source.

¹ The CAT NMS Plan was approved by the Commission, as modified, on November 15, 2016. See Securities Exchange Act Release No. 79318 (November 15, 2016), 81 FR 84696 (November 23, 2016) (“CAT NMS Plan Approval Order”).

² Unless otherwise noted, capitalized terms are used as defined in the CAT NMS Plan.

Section 36 of the Exchange Act grants the Commission the authority, with certain limitations, to “conditionally or unconditionally exempt any person, security, or transaction . . . from any provision or provisions of [the Exchange Act] or of any rule or regulation thereunder, to the extent that such exemption is necessary or appropriate in the public interest, and is consistent with the protection of investors.”³ Under Rule 608(e) of Regulation NMS, the Commission may “exempt from [Rule 608], either unconditionally or on specified terms and conditions, any self-regulatory organization, member thereof, or specified security, if the Commission determines that such exemption is consistent with the public interest, the protection of investors, the maintenance of fair and orderly markets and the removal of impediments to, and perfection of the mechanism of, a national market system.”⁴

For the reasons set forth below, this Order grants the Participants temporary conditional exemptive relief from certain requirements of the CAT NMS Plan, until the dates specified below. The Commission is granting temporary conditional exemptive relief from certain CAT NMS Plan requirements in order to allow Participants more time to meet such requirements and to allow Participants to prioritize and focus resources on implementation of other outstanding CAT NMS Plan requirements.

II. Discussion and Exemptive Relief

Participants and Industry Members have devoted and continue to expend substantial resources and efforts in the ongoing development of the CAT. The Commission believes that

³ 15 U.S.C. 78mm(a)(1).

⁴ 17 CFR 242.608(e).

granting the temporary exemptive relief until July 31, 2023,⁵ except where otherwise noted below, would provide Participants the time to develop the necessary technological, system or procedural changes to meet the CAT NMS Plan requirements discussed below. The Commission believes that granting temporary conditional exemptive relief from specific CAT NMS Plan requirements as discussed below is, pursuant to Section 36 of the Exchange Act, appropriate in the public interest and consistent with the protection of investors, and that pursuant to Rule 608(e), this exemptive relief is consistent with the public interest, the protection of investors, the maintenance of fair and orderly markets and the removal of impediments to, and the perfection of a national market system.

In addition to the conditions specific to the exemptive relief described below, the Commission is granting the exemptive relief described herein conditioned on the Participants providing information in Quarterly Progress Reports⁶ regarding the progress towards meeting these CAT NMS Plan requirements. Section 6.6(c)(ii)(B) of the CAT NMS Plan requires that for each “milestone” still in progress at the end of a given calendar quarter, the Participants must submit, among other things, a description of “any other factual indicators that demonstrate the current level of completion with respect to the milestone.” As a condition of the exemptive relief granted in this Order, the Participants are required to include a description of specific factual indicators that demonstrate the current level of completion with respect to the “Full

⁵ This date is approximately one year after the date by which the Participants previously estimated that the CAT would be fully implemented, July 11, 2022. See Securities Exchange Act Release No. 88890 (May 15, 2020), 85 FR 31322, 31334 (May 22, 2020).

⁶ See CAT NMS Plan at Section 6.6(c)(ii) (requiring Participants to file quarterly progress reports with the Commission tracking progress towards implementing the CAT NMS Plan requirements). See also Securities Exchange Act Release No. 88890 (May 15, 2020), 85 FR 31322 (May 22, 2020).

Implementation of CAT NMS Plan Requirements” milestone⁷ within the Quarterly Progress Reports required by the CAT NMS Plan. These factual indicators, as they apply to each CAT NMS Plan requirement, are discussed in greater detail below.

A. Timeframes for Lifecycle Linkages

The CAT NMS Plan requires specific timeframes for the identification, communication and correction of errors from the time an order event is received by the processor, including, by Noon Eastern Time T+1 (transaction date + one day), “[i]nitial data validation, lifecycle linkages and communication of errors to CAT Reporters.”⁸ This means that by 12pm EST the day after a transaction, the Plan Processor must have completed initial data validation, made lifecycle linkages (i.e., completed processing and linkage of the initial transaction data) and communicated errors to CAT Reporters. However, the Commission understands that the Plan Processor is currently unable to establish lifecycle linkages by the noon EST T+1 deadline as required by the CAT NMS Plan, but the Plan Processor does have the ability to provide an interim CAT Order ID and lifecycle linkages by 9pm EST T+1. To allow the Participants more time to make the technological changes necessary to meet the requirements of Section 6.1 of Appendix D, the Commission believes it is appropriate to grant temporary exemptive relief, until

⁷ See CAT NMS Plan at Section 1.1 (defining “Full Implementation of CAT NMS Plan Requirements” milestone). The Commission believes that these factual indicators relate to the Full Implementation of CAT NMS Plan Requirements milestone because this milestone “means the point at which Participants have satisfied all of their obligations to build and implement the CAT, such that all CAT system functionality required by Rule 613 and the CAT NMS plan has been developed, successfully tested and fully implemented[.]” Id.

⁸ See CAT NMS Plan at Section 6.1 of Appendix D. Section 6.1 of Appendix continues to provide the following timelines: (1) “8:00 a.m. Eastern Time T+3 (transaction date + three days) – Resubmission of corrected data; and” (2) “8:00 a.m. Eastern Time T+5 (transaction date + five days) – Corrected data available to Participant regulatory staff and the SEC.”

July 31, 2023, from the requirement that the Participants make lifecycle linkages of transaction data available by noon EST T+1. This relief is conditioned on the Participants providing an interim CAT Order ID and lifecycle linkages by 9pm EST T+1. Furthermore, as a condition of this relief, and for purposes of the Quarterly Progress Reports, factual indicators that demonstrate the current level of completion with respect to this CAT NMS Plan requirement must include a description of any improvements to the time by which the Plan Processor is capable of providing an interim CAT Order ID and lifecycle linkages. The Commission believes that this condition would allow the Commission to monitor the progress made towards meeting this CAT NMS Plan requirement prior to the expiration of the exemptive relief.

B. Re-Processing of Corrections Received after T+5

Section 3 of Appendix D of the CAT NMS Plan requires that all CAT Data reported to the Central Repository must be processed and assembled to create the complete lifecycle of each Reportable Event.⁹ Furthermore, Section 6.2 of Appendix D of the CAT NMS Plan states that if corrections are received after T+5 (transaction date + 5 days), Participants' regulatory staff and the SEC must be notified and informed as to how re-processing will be completed. The Commission understands that the Participants believe that re-processing data for corrections made after T+5 could negatively impact current development timelines and thus impede regulatory use of CAT Data, and that Section 3 of Appendix D does not require the re-processing of all data corrections made after T+5, but that the Participants do plan to establish procedures to identify when and how such data will be re-processed. However, under the CAT NMS Plan,

⁹ See, e.g., CAT NMS Plan, supra note 1, at Section 3 of Appendix D. Pursuant to Section 6.1 of Appendix D, the Plan Processor is required to make available corrected data to Participant regulatory staff and the SEC at 8:00 a.m. EST five days after a transaction date.

corrections received after T+5 are required to be re-processed, with the Participants' regulatory staff and SEC notified and informed as to how re-processing will be completed; it does not provide that re-processing is optional. To provide the Participants time to develop the changes necessary to handle the re-processing of all corrections received after T+5, the Commission believes it is appropriate to grant temporary exemptive relief, until July 31, 2021, from the requirement in Section 3 and Section 6.2 of Appendix D of the CAT NMS Plan that the Participants process and assemble the complete lifecycle for corrected Reportable Events received by the Plan Processor after T+5. As a condition of this relief, and for purposes of the Quarterly Progress Reports, factual indicators that demonstrate the current level of completion with respect to this CAT NMS Plan requirement must include a description of progress made with respect to the re-processing of all corrections received after T+5 prior to the expiration of the exemptive relief on July 31, 2021. The Commission believes that this condition would allow the Commission to monitor the progress made towards meeting this CAT NMS Plan requirement prior to the expiration of the exemptive relief.

C. Linkage of Participant Data and Industry Member Data with SIP Data

Section 6.5(b)(i) of the CAT NMS Plan requires, among other things, that the CAT Data and data from the Securities Information Processor (the "SIP") that is collected by the Central Repository ("SIP Data") when available to the Participant regulatory staff and the SEC "shall be linked," such that the Participant and Industry Member Data ("Transaction Data") collected by CAT and the SIP Data collected by CAT are part of the lifecycle of a single Order.¹⁰ However, the Commission understands that the CAT Plan Processor is unable to "link" Participant Data

¹⁰ Section 3 of Appendix D of the CAT NMS Plan requires that "[a]ll CAT Data reported to the Central Repository must be processed and assembled to create the complete lifecycle of each Reportable Event," and "CAT Data" explicitly includes "SIP Data."

and Industry Member Data with SIP Data as required by Section 6.5(b)(i) of the CAT NMS Plan. Rather, the Commission understands that the CAT Plan Processor is only able to provide a regulatory user a side-by-side view of – instead of a linkage between – both the transactional data in CAT and SIP Data through an online targeted query tool or a user-defined direct query.

In order to provide Participants more time to develop the changes necessary to meet the requirements of Section 6.5(b)(i), the Commission believes it is appropriate to, until July 31, 2023, grant a temporary exemption to the Participants from the requirement in Section 6.5(b)(i) of the CAT NMS Plan that requires the information collected by the Central Repository pursuant to paragraphs (c)(7) and (e)(7) of SEC Rule 613 to be provided to regulators in a linked manner, insofar as this provision applies to linking Participant Data and Industry Member Data with SIP Data as required by Section 6.5(b)(i). As a condition of this relief, and for purposes of the Quarterly Progress Reports, factual indicators that demonstrate the current level of completion with respect to this CAT NMS Plan requirement must include the release of updated specifications and/or scenarios documents relating to the linkage of Participant Data and Industry Member Data with SIP Data, such that SIP Data is incorporated in the lifecycle of an order. The Commission believes that this condition would allow the Commission to monitor the progress made towards meeting this CAT NMS Plan requirement prior to the expiration of the exemptive relief.

D. Reporting of Port-Level Settings Applicable to Orders

Port-level settings are special handling instructions associated with a port connection to another Industry Member or Participant and are used by Industry Members and Participants to instruct how to handle an Order (e.g., certain routing instructions) that are sent through that port connection. The CAT NMS Plan requires Industry Members to report the “Material Terms of an

Order,” including “any special handling instructions”¹¹ to the Central Repository for certain events in an Order’s lifecycle.¹² The Commission believes that the CAT NMS Plan’s requirement to report “Material Terms of an Order” including “any special handling instructions” requires the reporting of port-level settings because port-level settings provide instructions on how orders should be handled.¹³ Put another way, port-level settings are special handling instructions, and therefore these settings must be reported, consistent with the two-sided reporting obligations of CAT, by both the sender and receiver. For example, an instruction that prevents an order from trading with another order from the same broker-dealer (self-trade match prevention) is reportable as a special handling instruction even if the exchange does not need to apply the instruction because there is not another order from the same broker-dealer that would trade with the incoming order.

The Commission understands, however, that Participants and/or Industry Members would have to make technological changes to ensure the accurate and reliable reporting of port-level settings, and therefore, the Commission believes it is appropriate to, until July 31, 2023, exempt the Participants from requiring that both the CAT Reporter sending an Order and the CAT Reporter receiving an Order report port-level settings as part of the Material Terms of an Order. In order to monitor the Participants’ progress on compliance with the CAT NMS Plan’s reporting requirements, this exemptive relief is conditioned on the Participants engaging both the

¹¹ See CAT NMS Plan at Section 1.1.

¹² See CAT NMS Plan at Sections 1.1 and 6.4(d)(i), (ii), (iii), and (iv).

¹³ CAT NMS FAQ (D34) regarding the requirement to report material terms of an order that are communicated via default or implicit handling instructions states that generally, the party who “applies” the default or implicit handling instruction to the order is required to report any material terms in that instruction to CAT. See CAT NMS FAQ D34, available at: <https://www.catnmsplan.com/faq>.

Commission and Industry Members on a plan to address the reporting of port-level settings on an exchange-by-exchange basis. Furthermore, as a condition of this relief, and for purposes of the Quarterly Progress Reports, factual indicators must include the release of updated specifications and/or scenarios documents relating to the reporting of port-level settings by both the sender and receiver of an Order as a special handling instruction to demonstrate the current level of completion with respect to the CAT NMS Plan requirement that special handling instructions, including port-level settings, be reported as Material Terms of an Order. The Commission believes that these conditions would allow the Commission to monitor the progress made towards meeting this CAT NMS Plan requirement prior to the expiration of the exemptive relief.

E. Lifecycle Linkage Between Customer Orders and “Representative” Orders

The CAT NMS Plan requires that the Plan Processor must be able to link all related order events from all CAT Reporters involved in the lifecycle of an order, and this requirement applies to, among other things, “representative” orders. Specifically, the CAT NMS Plan states that the Central Repository must be able to create the lifecycle between customer orders to “representative” orders created in firm accounts for the purpose of facilitating a customer order (e.g., linking a customer order handled on a riskless principal basis to the street-side proprietary order).¹⁴ The Commission understands that the Participants do not currently have the ability to create lifecycles in certain representative order scenarios, particularly because of the difficulty of linking representative orders for Industry Members with separate order management systems and

¹⁴ See CAT NMS Plan at Section 3, Appendix D. A representative order is an order originated in a firm owned or controlled account, including principal, agency average price and omnibus accounts, by an Industry Member for the purpose of working one or more customer or client orders. See Securities Exchange Act Release No. 88702 (April 20, 2020), 85 FR 23075, 23076 n.26 (April 24, 2020) (“Phased Industry Member Reporting Order”).

execution management systems that do not currently have a systematic or direct link between them.¹⁵ While the Commission has granted exemptive relief relating to the timing of CAT NMS Plan reporting requirements for Industry Members,¹⁶ including the phased reporting of representative orders, the exemptive relief that was granted relates solely to the timing and phasing of reporting and not the substantive requirements of the CAT NMS Plan.¹⁷

In order to allow time for Participants and Industry Members to develop the capability of meeting CAT NMS Plan requirements relating to representative orders, the Commission believes it is appropriate to grant temporary exemptive relief, until July 31, 2023, from the CAT NMS Plan requirement that the Plan Processor create the lifecycle between customer orders to “representative” orders created in firm accounts for the purpose of facilitating a customer order, conditioned on the Participants continuing to require Industry Member reporting of representative orders as described in the Phased Industry Member Reporting Order. The Commission believes that granting relief until July 31, 2023 is appropriate because this would provide Participants the time necessary to determine how all representative orders are to be reported to CAT and time for Industry Members to make any changes necessary to report all representative orders. As a condition of this relief, and for purposes of the Quarterly Progress

¹⁵ See Industry Member Specifications, FINRA CAT, available at: <https://www.catnmsplan.com/specifications/im>.

¹⁶ In the Phased Industry Member Reporting Order, see supra note 14, the Commission granted exemptive relief from requirements in Sections 6.4, 6.7(a)(v) and 6.7(a)(vi) of the CAT NMS Plan related to Industry Member reporting of Industry Member Data to the Central Repository.

¹⁷ As a condition to the exemptive relief granted in the Phased Industry Member Reporting Order, the Participants represented that the full scope of CAT Data will be required to be reported to the CAT when Phase 2e has been implemented (by July 11, 2022), subject to any applicable exemptive relief or amendments to the CAT NMS Plan. See id. at 23076, 23079, 23080, 23081, 23083.

Reports, factual indicators that demonstrate the current level of completion with respect to this CAT NMS Plan requirement must include a description of progress made regarding the release of updated specifications and/or scenarios documents relating to the reporting of all representative orders. The Commission believes that this condition would allow the Commission to monitor the progress made towards meeting this CAT NMS Plan requirement prior to the expiration of the exemptive relief.

F. Participant Reporting of Rejected Orders

The CAT NMS Plan requires Participants to record and report to the Central Repository the receipt of an order and the time at which the order is received pursuant to Section 6.3(d) of the CAT NMS Plan. This requirement applies to when an order is received, which means that an order that a Participant receives, but then rejects (“rejected orders”) is a CAT Reportable event, and that the receipt of that order and the time at which that order was received also must be reported, pursuant to Section 6.3(d). Additionally, similar to all other CAT Data, rejected orders that are reported to the Central Repository must be processed and assembled to create the complete lifecycle of each Reportable Event.¹⁸ However, the Commission understands that the Participants are currently only able to report some but not all rejected orders, as required by Section 6.3(d).

In order to provide Participants more time to develop the changes necessary to meet the requirements of Section 6.3(d) of the CAT NMS Plan as they relate to rejected orders, the Commission believes it is appropriate to, until December 13, 2021, grant a temporary exemption to the Participants from the requirement in Section 6.3(d) of the CAT NMS Plan that requires the

¹⁸ See CAT NMS Plan at Appendix D, Section 3.

Participants to report rejected orders.¹⁹ As a condition to this relief, and for purposes of the Quarterly Progress Reports, factual indicators that demonstrate the current level of completion with respect to this CAT NMS Plan requirement must include a description of any updates to specifications and/or scenarios documents relating to the capture and reporting of rejected orders. The Commission believes that this condition would allow the Commission to monitor the progress made towards meeting this CAT NMS Plan requirement prior to the expiration of the exemptive relief.

III. Conclusion

For the reasons discussed above, the Commission believes that granting temporary exemptive relief, pursuant to Section 36 of the Exchange Act, is appropriate in the public interest and consistent with the protection of investors, and that pursuant to Rule 608(e), granting temporary exemptive relief is consistent with the public interest, the protection of investors, the maintenance of fair and orderly markets and the removal of impediments to, and the perfection of a national market system.

Accordingly, IT IS HEREBY ORDERED, pursuant to Section 36(a)(1) of the Exchange Act,²⁰ and Rule 608(e) of the Exchange Act²¹ that the Participants are granted an exemption, from: (1) the requirement in Section 6.1 of Appendix D of the CAT NMS Plan that requires Participants to make lifecycle linkages of transaction data available by noon EST T+1, until July

¹⁹ The Commission understands that Industry Member Specifications accommodates the reporting of rejected orders through “New Order Event” reporting, and that if an Industry Member receives an order, the Industry Member must report the receipt of the order and time of order receipt. See FINRA CAT, Industry Member Specifications, available at: <https://www.catnmsplan.com/specifications/im>; FINRA CAT, FAQ D3, available at: <https://www.catnmsplan.com/faq>.

²⁰ 15 U.S.C. 78mm(a)(1).

²¹ 17 CFR 242.608(e).

31, 2023; (2) the requirement in Sections 3 and 6.2 of Appendix D of the CAT NMS Plan that the Participants process and assemble the complete lifecycle for corrected Reportable Events received by the Plan Processor made after T+5, until July 31, 2021; (3) the requirement in Section 6(b)(i) of the CAT NMS Plan that requires the Participants to ensure that information collected pursuant to paragraphs (c)(7) and (e)(7) of SEC Rule 613 shall be linked when made available to the Participant regulatory staff and the SEC, until July 31, 2023; (4) the requirement in Sections 6.3(d)(i)(F), (ii)(G), (iii)(F), (iv)(E) and 6.4(d)(i) of the CAT NMS Plan that the Participants report, and amend their Compliance Rules to require Industry Members report the Material Terms of an Order that are communicated in port-level settings or instructions, until July 31, 2023; (5) the requirement in Section 3, Appendix D of the CAT NMS Plan that the Participants create the lifecycle between customer orders to representative orders created in firm accounts for the purpose of facilitating a customer order, until July 31, 2023, and (6) the requirement in Section 6.3(d) of the CAT NMS Plan that requires Participants to report rejected orders, until December 13, 2021, subject to the conditions described above.

By the Commission.

J. Matthew DeLesDernier
Assistant Secretary

EXHIBIT 3

**SECURITIES AND EXCHANGE
COMMISSION****17 CFR Part 242**

[Release No. 34-67457; File No. S7-11-10]

RIN 3235-AK51

Consolidated Audit Trail**AGENCY:** Securities and Exchange Commission.**ACTION:** Final rule.

SUMMARY: The Securities and Exchange Commission (“Commission”) is adopting Rule 613 under the Securities Exchange Act of 1934 (“Exchange Act” or “Act”) to require national securities exchanges and national securities associations (“self-regulatory organizations” or “SROs”) to submit a national market system (“NMS”) plan to create, implement, and maintain a consolidated order tracking system, or consolidated audit trail, with respect to the trading of NMS securities, that would capture customer and order event information for orders in NMS securities, across all markets, from the time of order inception through routing, cancellation, modification, or execution.

DATES: *Effective Date:* October 1, 2012.

FOR FURTHER INFORMATION CONTACT: Rebekah Liu, Special Counsel, at (202) 551-5665; Jennifer Colihan, Special Counsel, at (202) 551-5642; Carl Tugberk, Special Counsel, at (202) 551-6049; or Leigh Duffy, Special Counsel, at (202) 551-5928, Division of Trading and Markets, Securities and Exchange Commission, 100 F Street NE., Washington, DC 20549-7010.

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I. Executive Summary

In today’s high-speed electronic markets, trading is widely dispersed across a variety of market centers, including exchanges, Alternative Trading Systems (“ATs”), such as dark pools and Electronic Communication Networks (“ECNs”), and over-the-counter broker-dealers acting as market makers or block positioners. In their capacity as SROs, the Financial Industry Regulatory Authority (“FINRA”) and some of the exchanges currently maintain their own separate audit trail systems for certain segments of this trading activity, which vary in scope, required data elements and format. In performing their market oversight responsibilities, SRO and Commission staffs today must rely heavily on data from these various SRO audit trails.

As discussed more fully in part II.A below, there are shortcomings in the completeness, accuracy, accessibility, and timeliness of these existing audit trail systems. Some of these shortcomings are a result of the disparate nature of the systems, which make it impractical, for example, to follow orders through their entire lifecycle as they may be routed, aggregated, re-routed, and disaggregated across multiple markets. The lack of key information in the audit trails that would be useful for regulatory oversight, such as the identity of the customers who originate orders, or even the fact that two sets of orders may have been originated by the same customer, is another shortcoming.

Though SRO and Commission staff also have access to sources of market activity data other than SRO audit trails, these systems each suffer their own drawbacks. For example, data obtained from the Electronic Blue Sheet (“EBS”) ¹ system and equity cleared reports ² comprise only trade executions, and not orders or quotes. In addition, like data from existing audit trails, data from these sources lacks key elements important to regulators, such as the time of execution, and, in the case of equity cleared reports, the identity of the customer. Furthermore, recent experience with implementing incremental improvements to the EBS system has illustrated some of the

¹ EBSs are trading records requested by the Commission and SROs from broker-dealers that are used in regulatory investigations to identify buyers and sellers of specific securities. See Securities Exchange Act Release No. 44494 (June 29, 2001), 66 FR 35836 (July 9, 2001) (File No. S7-12-00) (adopting Rule 17a-25). See also Securities Exchange Act Release Nos. 26235 (November 1, 1988), 53 FR 44688 (November 4, 1988) (approving the Chicago Board Options Exchange’s (“CBOE”) rule for the electronic submission of transaction information); 26539 (February 13, 1989), 54 FR 7318 (February 17, 1989) (approving the National Association of Securities Dealers’ (n/k/a FINRA) rule for the electronic submission of transaction information); and 27170 (August 23, 1989), 54 FR 37066 (September 6, 1989) (approving the Philadelphia Stock Exchange’s (n/k/a NASDAQ OMX PHLX LLC) (“Phlx”) rule for the electronic submission of transaction information).

To partially address some of the current limitations of the EBS system, and to provide the Commission, in the short term, with more detailed and timely trade information for large traders, the Commission recently adopted new Rule 13h-1 concerning large trader reporting. See Securities Exchange Act Release No. 61908 (July 27, 2011), 76 FR 46960 (August 3, 2011) (“Large Trader Release”). Rule 13h-1 requires “large traders” to identify themselves to the Commission and make certain disclosures to the Commission on Form 13H. As adopted, Rule 13h-1 requires certain broker-dealers to capture and report through EBS the time of execution for any trade involving a large trader and a Commission-issued large trader identifier that identifies the large trader. See also Section II.A.3., *infra*.

On April 20, 2012, the Commission, among other things, extended the time by which registered broker-dealers were required to comply with Rule 13h-1 to allow broker-dealers additional time to develop, test, and implement enhancements to their recordkeeping and reporting systems as required under Rule 13h-1. See Securities Exchange Act Release No. 66839, 77 FR 25007 (April 26, 2012) (Order Temporarily Exempting Broker-Dealers From the Recordkeeping, Reporting, and Monitoring Requirements of Rule 13h-1 Under the Securities Exchange Act of 1934 and Granting an Exemption for Certain Securities Transactions) (“Large Trader Extension”).

² The Commission uses the National Securities Clearing Corporation’s (“NSCC”) equity cleared report for initial regulatory inquiries. This report is generated on a daily basis by the SROs and is provided to the NSCC in a database accessible by the Commission, and shows the number of trades and daily volume of all equity securities in which transactions took place, sorted by clearing member. The information provided is end-of-day data and is searchable by security name and CUSIP number.

overall limitations of the current technologies and mechanisms used by the industry to collect, record, and make available market activity data for regulatory purposes.³

The Commission therefore believes that the regulatory data infrastructure on which the SROs and the Commission currently must rely generally is outdated and inadequate to effectively oversee a complex, dispersed, and highly automated national market system. In performing their oversight responsibilities, regulators today must attempt to cobble together disparate data from a variety of existing information systems lacking in completeness, accuracy, accessibility, and/or timeliness—a model that neither supports the efficient aggregation of data from multiple trading venues nor yields the type of complete and accurate market activity data needed for robust market oversight.

To address this problem and improve the ability of the SROs and the Commission to oversee the securities markets, on May 26, 2010, the Commission proposed Rule 613,⁴ with the goal of creating a comprehensive consolidated audit trail⁵ that allows regulators to efficiently and accurately track all activity in NMS securities throughout the U.S. markets. As proposed—and summarized in part II.B below—Rule 613 required SROs to jointly submit an NMS plan⁶ that would govern the creation, implementation, and maintenance of a consolidated audit trail, including a central repository to receive and store consolidated audit trail data. In the proposed Rule, the Commission specified many requirements that the NMS plan, and by extension the consolidated audit trail, must meet, ranging from details of the

data elements to be collected, to the timing of data transmissions, to specific standards for data formatting.

Among its various requirements, the proposed Rule mandated that the NMS plan developed by the SROs must in turn require each SRO and its members to capture and report specified trade, quote, and order activity in all NMS securities⁷ to the central repository in real time, across all markets, from order inception through routing, cancellation, modification, and execution. The proposed Rule also mandated that the NMS plan require the creation of unique order identifiers to facilitate the ability of regulators to view cross-market activity, as well as unique customer identifiers to enhance the ability of regulators to reliably and efficiently identify the beneficial owner of the account originating an order or the person exercising investment discretion for the account originating the order, if different from the beneficial owner.

The Commission received 64 comment letters from 56 commenters in response to the proposed consolidated audit trail representing a wide range of viewpoints, as summarized in part II.C below.⁸ The commenters included national securities exchanges, a national securities association, technology providers, academics, broker-dealers, organizations representing industry participants, individual investors, and members of Congress.⁹ Of the comment letters received, 13 expressed support for the proposal;¹⁰ 36 expressed support, but suggested modifications to certain provisions of the proposal;¹¹

five solely suggested modifications to the proposal;¹² two opposed the proposal;¹³ and seven neither supported nor opposed the substance of the proposal.¹⁴ Concerns raised in these comment letters included: (1) The appropriateness of real-time reporting of required data to the central repository;¹⁵ (2) the scope of the required data elements, including the use of unique order identifiers and unique customer identifiers;¹⁶ and (3) the burden and costs associated with the proposal.¹⁷ In addition, a number of commenters offered alternative approaches and made suggestions regarding the creation, implementation, and maintenance of the consolidated audit trail.¹⁸

BATS Letter; SIFMA Letter; SIFMA February 2012 Letter; CBOE Letter; Direct Edge Letter; Angel Letter; IAG Letter; Managed Funds Association Letter; Mansfield Letter; Marketcore Letter; Kumaraguru Letter; Ameritrade Letter; FINRA Letter; Wells Fargo Letter; Noetic Partners Letters; Knight Letter; FIF Letter; FIF Letter II; Albany Letter; Endace Letter; Ross Letter; FINRA Proposal Letter; Schumer Letter; FIA Letter; STA Letter; Van Bokkelen Letter.

¹² See Belanger Letters; SIFMA Drop Copy Letter; Wachtel Letter; High Speed Letter (recommending next steps in the development of the consolidated audit trail).

¹³ See BondMart Letter; Leuchtkafer Letter.

¹⁴ See Broadridge Letter; FIX Letter; Know More Letter; Aditail Letter; iSys Letter; Kaufman Letter; Berkeley Letter.

¹⁵ See Scottrade Letter, p. 1; ICI Letter, p. 4–6; FINRA/NYSE Euronext Letter, p. 4; GETCO Letter, p. 2; BATS Letter, p. 1–2; SIFMA Letter, p. 3–8; SIFMA February 2012 Letter, p. 1; CBOE Letter, p. 4–5; Direct Edge Letter, p. 3; FINRA Letter, p. 10–13; Wells Fargo Letter, p. 3; Knight Letter, p. 2–3; Leuchtkafer Letter; Broadridge Letter, p. 3; FIF Letter, p. 4; SIFMA Drop Copy Letter, p. 1; Ross Letter, p. 1; FINRA Proposal Letter, p. 3; FIA Letter, p. 1–2.

¹⁶ See Ameritrade Letter, p. 3; Kumaraguru Letter, p. 1; FINRA Proposal Letter, p. 6–8, 13 and Appendix A.; Angel Letter, p. 2–3; Managed Funds Association Letter, p. 2; SIFMA Letter, p. 11–12, 14; SIFMA Drop Copy Letter, p. 2; Liquidnet Letter p. 6–7; FINRA Letter, p. 4, 7–9; CBOE Letter, p. 2; Knight Letter, p. 2; Scottrade Letter, p. 1; DirectEdge Letter, p. 3; FIF Letter, p. 2–3, 6–7; FIF Letter II, p. 2; BOX Letter, p. 2; Wells Fargo Letter, p. 3; Ross Letter, p. 1; ICI Letter, p. 3; Thomson Reuters Letter, p. 3; Endace Letter, p. 1–2; GETCO Letter, p. 4.

¹⁷ See Thomson Reuters Letter, p. 2; Liquidnet Letter, p. 1; CBOE Letter, p. 2, 4–5; Nasdaq Letter I, p. 2; Angel Letter, p. 1–2; IAG Letter, p. 3.; Kaufman Letter, attachment p. 3; Wells Fargo Letter, p. 3–4; Noetic Partners Letter, p. 2; Leuchtkafer Letter, p. 1–5; Broadridge Letter, p. 3; FINRA Proposal Letter, p. 2–3.; High Speed Letter, p. 1; Belanger Letter, p. 7–8; Corelix Letter, p. 2.; FTEN Letter, p. 13; SIFMA Letter, p.1–8, 15–16; FINRA/NYSE Euronext Letter, p. 4, 7; FINRA Letter, p. 3, 10–13; Scottrade Letter, p. 1; ICI Letter, p. 4–6; GETCO Letter, p. 2; BATS Letter, p. 1–2; Direct Edge Letter, p. 3; Knight Letter, p. 2–3; Leuchtkafer Letter; Broadridge Letter, p. 3; FIF Letter, p. 4; SIFMA Drop Copy Letter, p. 1; Ross Letter, p. 1; SIFMA February 2012 Letter; FIA Letter, p. 1–2; Noetic Partners Letter II, p. 2; High Speed Letter, p. 1.

¹⁸ See FINRA Proposal Letter; Angel Letter, p. 3; BOX Letter, p. 2; BATS Letter, p. 2; CBOE Letter,

Continued

³ See Large Trader Extension, *supra* note 1.

⁴ See Securities Exchange Act Release No. 62174 (May 26, 2010), 75 FR 32556 (June 8, 2010) (“Proposing Release”). The comment file is on the Commission’s Web site at: <http://www.sec.gov/comments/s7-11-10/s71110.shtml>.

⁵ In this release, “consolidated audit trail” means both a system capable of capturing a complete record of all transactions relating to an order, from origination to execution or cancellation, and the complete record for an order generated by such a system, as the context may require.

⁶ NMS plan is defined in Rule 600(b)(43) to mean “any joint self-regulatory organization plan in connection with: (i) [t]he planning, development, operation or regulation of a national market system (or a subsystem thereof) or one or more facilities thereof; or (ii) [t]he development and implementation of procedures and/or facilities designed to achieve compliance by self-regulatory organizations and their members with any section of [Regulation NMS] * * *.” 17 CFR 240.600(b)(43). Such NMS plan may be subject to modification prior to approval by the Commission pursuant to Rule 608 of Regulation NMS, as discussed in Section III.C.2.a.v., *infra*.

⁷ “NMS security” is defined in Rule 600(a)(46) of Regulation NMS to mean “any security or class of securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan, or an effective national market system plan for reporting transactions in listed options.” 17 CFR 242.600(a)(46). NMS stock is defined in Rule 600(47) to mean “any NMS security other than an option.” 17 CFR 242.600(a)(46). A listed option is defined in Rule 600(a)(35) of Regulation NMS to mean “any option traded on a registered national securities exchange or automated facility of a national securities association.” 17 CFR 242.600(a)(35).

⁸ See Exhibit A for a citation key to the comment letters received by the Commission on the proposed rule. The Commission also received four comment letters that do not address the substance of the consolidated audit trail proposal. See Ericson Letter; Kondracki Letter; Grady Letter; Deep Liquidity Letter.

⁹ The Commission notes that, in some cases, commenters fell into more than one such category.

¹⁰ See Vannelli Letter; Beach Letter; Foothill Letter; Green Letter; Wealth Management Letter; McCrary Letter; Anastasopoulos Letter; Triage Letter; FTEN Letter; Middle Office Letter; Corelix Letter; Lettieri Letter; Bean Letter.

¹¹ See ICI Letter; Thomson Reuters Letter; Scottrade Letter; Liquidnet Letter; FINRA/NYSE Euronext Letter; BOX Letter; Nasdaq Letter I; Nasdaq Letter II; TIAA-CREF Letter; GETCO Letter;

In consideration of the views expressed, suggestions for alternatives, and other information provided by those commenting on the proposed Rule, the Commission is adopting Rule 613 with significant modifications to the proposed requirements for the NMS plan submitted to the Commission for its consideration. In certain instances these modifications alter the data and collection requirements of the proposed Rule. In other instances, the adopted Rule has been altered to be less prescriptive, and hence less limiting, in the means SROs may use to meet certain requirements. Some of the more significant changes are as follows:

- *Replacing Real-Time Reporting with a Requirement to Report Data by 8 a.m. of the Next Trading Day.* The adopted Rule no longer requires that the NMS plan provide for the reporting of order event data¹⁹ to the central repository in real time; rather, it provides that the NMS plan must require the reporting of order event data to the central repository by 8 a.m. Eastern Time on the trading day following the day such information has been recorded by the SRO or the member.²⁰ The NMS plan may accommodate voluntary submissions of order event data prior to 8 a.m. on the following trading day, but it may not mandate a reporting deadline prior to 8 a.m.
- *Providing More Flexibility to Determine the Format of Data Reported*

p. 2–3; SIFMA Letter, p. 16–18; Wells Fargo Letter, p. 2; Knight Letter, p. 3; FIF Letter, p. 5–6; Schumer Letter, p. 1; FIF Letter, p. 1–3; FINRA Letter, p. 3, 6; FINRA/NYSE Euronext Letter, p. 8, 14; SIFMA Drop Copy Letter.

¹⁹ As used herein, the term “order event data” is used to refer to the information reported pursuant to Rule 613(c)(3) and identified in Rule 613(c)(7)(i) through (v), generally including: (1) The Customer-ID(s) for each customer, including the person giving a modification or cancellation instruction; (2) the CAT-Order-ID; (3) the CAT-Reporter-ID of the broker-dealer, national securities exchange, or national securities association receiving, originating, routing, modifying, cancelling or executing an order, and to which an order is being routed; (4) the identity and nature of the department or desk to which an order is routed, if routed internally at the broker-dealer; (5) the date an order was received, originated, routed, modified, cancelled, or executed; (6) the time an order was received, originated, routed, modified, cancelled, or executed; (7) material terms of an order and any changes of such terms, if modified; (8) the price and remaining size of an order, if modified; (9) execution capacity (principal, agency, riskless principal); (10) execution price and size; and (11) whether the execution was reported pursuant to an effective transaction reporting plan or the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information (“OPRA”). See Section III.B.1.d., *infra*. Information reported pursuant to Rule 613(c)(4) and identified in Rule 613(c)(7)(vi) through (viii) is referred to as “supplemental data.”

²⁰ See Rule 613(c)(3); Sections II.A., III.B.1.e., *infra*.

to the Central Repository. The proposed Rule mandated that the NMS plan require the SROs and their members to collect and provide to the central repository the required order and event information in a uniform electronic format. The adopted Rule instead allows the SROs to determine the details of how market participants would transmit data to the central repository (which might include multiple electronic formats, rather than a uniform electronic format), subject to a more general requirement that data must be transmitted in a manner that ultimately allows the central repository to make this data available to regulators in a uniform electronic format.²¹

- *Eliminating the Requirement to Report Orders with a Unique Order Identifier.* The proposed Rule mandated that each order reported to the central repository be tagged with a unique identifier that is the same throughout the order’s entire lifecycle. In the adopted Rule, this requirement is replaced with a more general requirement that once all order events are transmitted to the central repository, the repository must be able to efficiently and accurately link together all lifecycle events for the same order, and make available to regulators this linked order data.²²

- *Extending the Compliance Period for Small Broker-Dealers.* Under the adopted Rule, the NMS plan may provide that small broker-dealers be allowed up to three years, rather than two years as proposed, from the effectiveness of the NMS plan to provide the required data to the consolidated audit trail.²³

In addition to the above modifications, the Commission has also added a number of new requirements to the adopted Rule in response to general concerns expressed by commenters regarding the process for the development and implementation of the NMS plan. Some of the more significant of these additions are as follows:

- *Considering and Explaining Choices and Available Alternatives.* The adopted Rule requires that the NMS plan describe and discuss any reasonable alternative approaches to the creation of the consolidated audit trail that were considered by the SROs and why the approach set forth by the NMS plan was selected.²⁴

- *Planning for Future System Efficiencies.* The adopted Rule requires

²¹ See Rule 613(c)(2); Sections III.B.1.f., III.B.2., *infra*.

²² See Rule 613(j)(1); Section III.B.1.d.iv., *infra*.

²³ See Rule 613(a)(3)(vi); Section III.B.1.c., *infra*.

²⁴ See Rule 613(a)(1)(xii); Section III.C.2.a., *infra*.

that the NMS plan provide a plan to eliminate existing rules and systems (or components thereof) that are rendered duplicative by the consolidated audit trail, including identification of such rules and systems (or components thereof). Further, to the extent that any existing rules or systems related to monitoring quotes, orders, and executions provide information that is not rendered duplicative by the consolidated audit trail, such plan must also include an analysis of (1) whether the collection of such information remains appropriate, (2) if still appropriate, whether such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail, and (3) if no longer appropriate, how the collection of such information could be efficiently terminated. Finally, such plan must also discuss the steps the plan sponsors propose to take to seek Commission approval for the elimination of such rules and systems (or components thereof); and a timetable for such elimination, including a description of how the plan sponsors propose to phase in the consolidated audit trail and phase out such existing rules and systems (or components thereof).²⁵

- *Considering Input.* The adopted Rule requires the NMS plan to address the process by which the plan sponsors solicited views of their members and other appropriate parties regarding the creation, implementation, and maintenance of the consolidated audit trail, provide a summary of the views of such members and other parties, and describe how the plan sponsors took such views into account in preparing the NMS plan.²⁶ In addition, the adopted Rule also requires the NMS plan to provide for the establishment of an Advisory Committee whose function will be to advise the plan sponsors on the implementation, operation, and administration of the central repository.²⁷

- *Periodic Reviews of the Consolidated Audit Trail.* To help assure the Commission that as financial markets evolve and new technologies emerge, the consolidated audit trail remains a useful regulatory tool, the adopted Rule mandates that the NMS plan must require the central repository’s Chief Compliance Officer to regularly review the operations of the consolidated audit trail, and, in light of

²⁵ See Rule 613(a)(1)(ix); Section III.C.2.a., *infra*.

²⁶ See Rule 613(a)(1)(xi).

²⁷ See Rule 613(b)(7). For a further discussion of the composition of the Advisory Committee, see Section III.B.3.b., *infra*.

market and technological developments, make appropriate recommendations for enhancements to the consolidated audit trail.²⁸

The Commission has also added certain requirements to the adopted Rule in response to specific concerns expressed by commenters with respect to the use of consolidated audit trail data. Some of the more significant of these additions are as follows:

- *Enhancing Security and Privacy Requirements.* Commenters have expressed concerns regarding the risk of failing to maintain appropriate controls over the privacy and security of consolidated audit trail data.

Accordingly, the adopted Rule requires the NMS plan to include additional policies and procedures that are designed to ensure the rigorous protection of confidential information collected by the central repository.²⁹

- *Addressing and Limiting Errors.* Commenters have also expressed concerns about the potential for errors in the consolidated audit trail; the adopted Rule requires the SROs to provide in their NMS plan detailed information regarding anticipated error rates as well as the plan's proposed error correction process.³⁰

The Commission generally believes that the collective effect of the modifications and additions described above will be to significantly expand the set of solutions that could be considered by the SROs for creating, implementing, and maintaining a consolidated audit trail and to provide the SROs with increased flexibility in how they choose to meet the requirements of the adopted Rule, relative to the alternatives that would have been available under the requirements of the proposed Rule. The Commission further believes that these changes address or mitigate the principal concerns raised by commenters—including concerns regarding the extent and cost of the systems changes required by the SROs and their members—while continuing to enable the SROs and the Commission to achieve significant benefits from the consolidated audit trail.³¹ Each of the modifications and additions noted above is described and explained in detail in part III below.

Given these changes and the wide array of commenters' views on how to best create, implement, and maintain a consolidated audit trail, the Commission expects that the SROs will

seriously consider various options as they develop the NMS plan to be submitted to the Commission for its consideration.³² Indeed, some commenters recognized that a consolidated audit trail could be created, implemented, and maintained in a number of ways, and thus recommended that the Commission replace the specific systems requirements of the proposed Rule with more general "end-user" requirements, perform an analysis of how existing audit trail systems do and do not meet the needs of regulators, and perhaps even engage in a formal request-for-proposal ("RFP") process.³³

In light of the expanded solution set that should be available under the changes described above and commenter views on the NMS plan development process, the adopted Rule now requires the SROs to provide much more information and analysis to the Commission as part of their NMS plan submission. These requirements have been incorporated into the adopted Rule as "considerations" that the SROs must address, and generally mandate that the NMS plan discuss: (1) The specific features and details of the NMS plan (e.g., how data will be transmitted to the central repository, when linked data will be available to regulators); (2) the SROs' analysis of NMS plan costs and impact on competition, efficiency, and capital formation; (3) the process followed by the SROs in developing the NMS plan (e.g., the requirement to solicit input from members of the SROs and other appropriate parties); and (4) information about the implementation plan and milestones for the creation of the consolidated audit trail.

These requirements are intended to ensure that the Commission and the public have sufficiently detailed information to carefully consider all aspects of the NMS plan ultimately submitted by the SROs, facilitating an analysis of how well the NMS plan would allow regulators to effectively and efficiently carry out their responsibilities. To help elicit the most appropriate information and analysis from the SROs in response to these requirements, the Commission is furnishing further details about how it envisions regulators would use, access, and analyze consolidated audit trail data through a number of "use cases."

These use cases and accompanying questions should help the SROs prepare an NMS plan that better addresses the requirements of the adopted Rule, as well as aid the Commission and the public in gauging how well the NMS plan will address the need for a consolidated audit trail.³⁴

Because the Commission believes the adopted Rule permits a wider array of solutions to be considered by the SROs than the proposed Rule did and because the Commission and the public will be able to avail themselves of much more information and analysis in connection with the NMS plan submission, the Commission is also making significant modifications to the process by which it will consider the costs and benefits of the creation, implementation, and maintenance of a consolidated audit trail, as well as the potential impacts on efficiency, competition, and capital formation. In particular, the methodology that the Commission used in the Proposing Release to estimate the costs of creating, implementing, and maintaining a consolidated audit trail may be no longer suitable. As discussed in the Proposing Release, the approximately \$4 billion cost estimate for the creation and implementation of a consolidated audit trail was primarily based on averages for the development from scratch of new, very large-scale market systems.³⁵ However, the Commission's rationale for this approach was predicated on some of the specific technical requirements of the proposed Rule, especially those related to the real-time collection and standard formatting of all data. As such, the approach assumed that the consolidated audit trail would not be able to build on existing trade, order, and audit trail systems. As noted above, these assumptions may no longer be valid since several of the specific technical requirements underlying the Proposing Release's approach have been substantially modified. The Commission believes these changes would now permit a wider array of solutions to be considered by the SROs, including solutions that could capitalize on existing systems and standards.³⁶

In light of these changes, the Commission believes that the economic consequences of the consolidated audit trail now will become apparent only over the course of the multi-step process

²⁸ See Section III.B.2., *infra*.

²⁹ See Rule 613(e)(4).

³⁰ See Rule 613(e)(6); Section III.B.2., *infra*.

³¹ See Section II.A., *infra*, for a discussion of the objectives of the consolidated audit trail.

³² See, e.g., FINRA Letter, p. 14 (advocating that SROs build off existing audit trails to develop a consolidated audit trail) and Nasdaq Letter I, p. 11–12 (arguing against building off existing audit trail systems and supporting the development of new system to establish a consolidated audit trail).

³³ See Nasdaq Letter I, p. 12; FIF Letter II, p. 2–3; STA Letter, p. 1–3; Direct Edge Letter, p. 2–3, 5.

³⁴ See Section III.C.2.b., *infra*.

³⁵ The methodology in the Proposing Release assumed that the scope of the required systems changes would be comparable to those made in connection with Regulation NMS. See Proposing Release, *supra* note 4, at 32597, n. 352.

³⁶ See, e.g., FINRA Letter, p. 14; SIFMA Letter, p. 16–18.

for developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail. In particular, the Commission believes that the costs and benefits of creating a consolidated audit trail, and the consideration of specific costs as related to specific benefits, is more appropriately analyzed once the SROs narrow the expanded array of choices they have under the adopted Rule and develop a detailed NMS plan. The Commission therefore is focusing its economic analysis in this Release on the actions the SROs are required to take upon approval of the adopted Rule—specifically the requirement that the SROs develop an NMS plan, utilizing their own resources and undertaking their own research, that addresses the specific details, cost estimates, considerations, and other requirements of the Rule.³⁷ A robust economic analysis of the next step—the actual creation and implementation of a consolidated audit trail itself—requires information on the plan’s detailed features (and their associated cost estimates) that will not be known until the SROs submit their NMS plan to the Commission for its consideration. Accordingly, the Commission is deferring this analysis until such time as it may approve any NMS plan—that is, after the NMS plan, together with its detailed information and analysis, has been submitted by the SROs and there has been an opportunity for public comment.

To that end, the adopted Rule requires that the SROs: (1) Provide an estimate of the costs associated with creating, implementing, and maintaining the consolidated audit trail under the terms of the NMS plan submitted to the Commission for its consideration; (2) discuss the costs, benefits, and rationale for the choices made in developing the NMS plan submitted; and (3) provide their own analysis of the submitted NMS plan’s potential impact on competition, efficiency and capital formation. The Commission believes that these estimates and analyses will help inform public comment regarding the NMS plan and will help inform the Commission as it evaluates whether to approve the NMS plan. In this way, the Commission can develop estimates of the costs for the creation, implementation, and maintenance of the consolidated audit trail that benefit from cost data and information provided by the SROs.

The Commission notes that this approach is suited for the multi-step nature of the particular process for

developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail. Further, because the Commission is deferring its final analysis of the consolidated audit trail until after a detailed NMS plan has been submitted to the Commission for its consideration and the public has had an opportunity to comment, the adopted Rule has been modified to include a mandate that in determining whether to approve the NMS plan and whether the NMS plan is in the public interest, the Commission must consider the impact of the NMS plan on efficiency, competition, and capital formation of creating, implementing, and maintaining the NMS plan.³⁸ The Commission also will consider the costs and benefits of the creation, implementation, and maintenance of the consolidated audit trail pursuant to the details proposed in the NMS plan submitted to the Commission for its consideration.

As a result of the new requirements for SROs to provide additional information about costs and a number of other aspects of the NMS plan they submit, the Commission is extending the timeframe for the submission of the NMS plan from 90 days from the date of approval of Rule 613 to 270 days from the date of publication of the adopting release for Rule 613 (“Adopting Release”) in the **Federal Register**. The Commission also is altering the timeframe within which SROs must submit proposed rule changes to require their members to comply with the requirements of the Rule and the NMS plan approved by the Commission³⁹ and the deadline for submitting the document required by Rule 613(i) regarding the possible expansion of the scope of the NMS plan.⁴⁰

II. Introduction

A. Need for, and Objectives of, a Consolidated Audit Trail

The Commission believes that the Rule adopted today is an appropriate step in the creation of a consolidated audit trail which, when implemented,

should substantially enhance the ability of the SROs and the Commission to oversee today’s securities markets and fulfill their responsibilities under the federal securities laws. Rule 613 requires the submission of an NMS plan to create, implement, and maintain the first comprehensive audit trail for the U.S. securities markets, which will allow for the prompt and accurate recording of material information about all orders in NMS securities, including the identity of customers, as these orders are generated and then routed throughout the U.S. markets until execution, cancellation, or modification. This information will be consolidated and made readily available to regulators in a uniform electronic format.

This section reviews the current status and limitations of existing, discrete audit trails and discusses how a consolidated audit trail could address those limitations and improve the ability of the SROs and the Commission to perform their regulatory functions. To perform this review, the Commission is, in part, drawing upon its own experiences in using existing audit trails to carry out its regulatory duties.⁴¹ The Commission also is relying on information provided to the Commission from other regulators who use existing audit trail systems, broker-dealers and organizations representing industry participants, and those with expertise in data management and technology solutions that may be applicable to the adopted requirements.

1. Use and Limitations of Current Sources of Trading Data

It has become increasingly challenging for SROs and the Commission to oversee the U.S. securities markets across the multitude of trading venues, given the huge volume of orders and trades that are generated, routed, transformed, and then re-routed across dozens of venues every day. Among the challenges is the fact that there is no single, comprehensive audit trail available to regulators.⁴² At present, the SROs and the Commission must use a variety of data sources, including EBS,⁴³ equity cleared reports,⁴⁴ and SRO audit trail data to help fulfill their regulatory obligations. As a result, among other issues, regulatory authorities face many challenges in obtaining, reconciling, and making effective use of even the limited

³⁸ See Rule 613(a)(5).

³⁹ The proposed Rule would have required SROs to submit such proposed rule changes on or before from 120 days from approval of the Rule. Because the adopted Rule permits the SROs up to 270 days from the date of publication of the Adopting Release in the **Federal Register** to submit NMS plans, the Commission believes that the more appropriate deadline for SROs to submit rule changes is 60 days from the date the Commission approves an NMS plan.

⁴⁰ Specifically, the adopted Rule provides SROs six months, instead of two months, after effectiveness of the NMS plan to submit this document to the Commission.

⁴¹ See Proposing Release, *supra* note 4, at 32558–61.

⁴² See FINRA/NYSE Euronext Letter, p. 1–3; Nasdaq Letter I, p. 1–5.

⁴³ See note 1, *supra*; Proposing Release, *supra* note 4, at 32557–58.

⁴⁴ See note 2, *supra*.

³⁷ See Rule 613(a)(1).

order and execution data that is available, thereby hindering the conduct of market surveillance, investigation and enforcement activities, and market reconstructions and analyses.⁴⁵

The ultimate effectiveness of core SRO and Commission regulatory efforts depends on the following four qualities of trade and order (collectively “market”) data:

- Accuracy. Is the data about a particular order or trade correct?
- Completeness. Does the data represent all market activity of interest, or just a subset? Is the data sufficiently detailed to provide the required information?
- Accessibility. How is the data stored? How practical is it to assemble, aggregate, reconcile, and process the data? Can all appropriate regulators acquire the data they need?
- Timeliness. When is the data available to regulators? How long will it take to process before it can be used for regulatory analyses?

SROs generally use market data in the form of audit trails to identify potential misconduct in the markets they oversee, including attempts to manipulate market quotations, inflate trading or order volume artificially, or profit from non-public information. When these surveillance efforts identify suspicious trading activity, SROs have a responsibility to open investigations in which they assemble and review additional market data to assess the nature and scope of the potential misconduct. When an SRO detects persistent problems in the market it oversees, it may write new rules for its members to address the problems. To inform these rulemaking efforts, SROs frequently gather and analyze significant amounts of market data. The effectiveness of such efforts is largely determined by the qualities of the data available.⁴⁶

The qualities of such market data are also primary determinants of the

⁴⁵ The term “market reconstruction” is used to refer to the efforts by SRO and Commission staff to collect and process detailed trade and order data, often from multiple and varied data sources (e.g., market participants, trading venues, and other SROs) to recreate the sequence of events and market conditions that existed over a given period of time. A recent example of this occurred following the “Flash Crash” of May 6, 2010, with the market reconstruction analysis undertaken by Commission and the Commodity Futures Trading Commission (“CFTC”) staff, which can be found in the “Findings Regarding the Market Events of May 6, 2010: Report of the Staffs of the CFTC and the SEC to the Joint Advisory Commission Emerging Regulatory Issues.” See <http://www.sec.gov/news/studies/2010/marketevents-report.pdf>.

⁴⁶ The Commission recognizes that the accuracy of the data available may also be subject to occasional errors, including errors caused by rare and unexpected events.

Commission’s ability to fulfill its statutory mission. The Commission uses market data in most of its investigations of potential securities law violations. In many of these investigations, market data analysis frames the issues for investigation and is a primary means of identifying relationships between individuals and entities whose activities may threaten the integrity of the securities markets or create substantial and unnecessary investor losses. The Commission also uses audit trails and other sources of market data to: (1) Inform its priorities for examinations of broker-dealers, investment advisers and SROs; (2) supplement the data and information it collects during those examinations; and (3) determine the nature and scope of any potential misconduct the examinations identify. The Commission also relies heavily on market data to identify patterns of trading and order activity that pose risks to the securities markets and to inform regulatory initiatives, as well as to perform market reconstructions. In addition, the Commission relies on market data to improve its understanding of how markets operate and evolve, including with respect to the development of new trading practices, the reconstruction of atypical or novel market events, and the implications of new markets or market rules. As is the case for the SROs, the effectiveness of such efforts by the Commission is largely determined by the qualities of the data available.⁴⁷

As described in the following sections, each of the present sources of market data available to regulators suffers from deficiencies limiting its effective use.

a. The EBS System

The EBS system is currently the only available source of data that allows regulators to obtain the identity of customers of broker-dealers who have executed trades. The SROs and the Commission have depended on this system for decades to request trading records from broker-dealers. The EBS system, supplemented by the requirements of Rule 17a–25 under the Exchange Act,⁴⁸ is generally used by

⁴⁷ The effectiveness of such efforts with respect to cross-market activities within the Commission’s jurisdiction depends on the qualities of data from multiple sources, such as separate SRO audit trails used for equities and equity options. See Section II.A.1.c., *infra*. This dependency also exists with respect to market activities that involve other products outside the Commission’s jurisdiction, such as futures and certain swaps. See note 239, *infra*.

⁴⁸ 17 CFR 240.17a–25. Rule 17a–25 codified the requirement that broker-dealers submit to the Commission, upon request, information on their

SRO and Commission staff to assist in the investigation of possible securities law violations, typically involving insider trading and market manipulations.⁴⁹ In its electronic format, the EBS system provides certain detailed execution information, upon request by SRO or Commission staff, for specific securities during specified timeframes. However, EBS data, which is currently sourced from the so-called back-office records of clearing brokers, are limited to executed trades and do not contain information on orders or quotes (and thus no information on routes, modifications, and cancellations). Also, in frequent cases where brokers utilize average-price accounts to execute and aggregate multiple trades for one or more customers, the details of each individual trade execution are typically lost when reported through the EBS system because it is only the average aggregate price and volume of a series of executed trades that are transmitted to the clearing systems for processing.⁵⁰

Furthermore, the EBS data currently includes only the dates, but not the times, of each trade execution (regardless of whether or not the trade represents an average-price series of executions).⁵¹ Since there could be many broker-dealers trading a given security on a given day of interest, to reconstruct trading on the market for one security on one day could involve many, perhaps hundreds, of EBS requests. Consequently, EBS data, alone, are not generally useful for price or short sale manipulations analysis, order flow analysis, depth-of-book analysis, or any large-scale market reconstructions in which the timing of events is required to build a useful picture of the market.⁵²

In addition, though the EBS system provides the names associated with each account in which a trade has been

customer and proprietary securities transactions in an electronic format. The rule requires submission of the same standard customer and proprietary transaction information that SROs request through the EBS system in connection with their market surveillance and enforcement inquiries.

⁴⁹ See Rule 17a–25; *supra* note 1, and accompanying text.

⁵⁰ See FIF Letter I, p. 3; SIFMA Letter, p. 18–19.

⁵¹ As adopted, Rule 13h–1 requires certain broker-dealers to capture and report through EBS the time of execution for any trade involving a large trader and a Commission-issued large trader identifier that identifies the large trader. See Large Trader Release and Large Trader Extension, *supra* note 1.

⁵² A 1990 Senate Report acknowledged the immense value of the EBS system, but noted that “it is designed for use in more narrowly focused enforcement investigations that generally relate to trading in individual securities. It is not designed for use for multiple inquiries that are essential for trading reconstruction purposes.” See S. Rep. No. 300, 101st Cong., 2d Sess. 2–5 (1990), at 48.

placed, these names are based on the separate records of each broker-dealer providing data to the EBS system, and the same party may be identified by a different name across multiple broker-dealers. Experience of staff at the Commission has shown⁵³ that it is difficult to perform cross-broker customer analysis of trading since the same customer may be known by different names depending on the account and broker-dealer through which it traded.

The EBS system also typically requires SRO and Commission staff needing EBS data to request the information from each broker-dealer, and complete responses from each broker-dealer may take days or weeks depending upon the scope of the request. As a result of these various limitations, the EBS system is generally only used by regulators in narrowly-focused enforcement investigations that generally involve trading in particular securities on particular dates or with specific broker-dealers.

b. Equity Cleared Reports

In addition to the EBS system and Rule 17a–25, the SROs and the Commission also rely upon the NSCC⁵⁴ equity cleared report for initial regulatory inquiries.⁵⁵ This report is generated on a daily basis by the SROs, is provided to the NSCC, and shows the number of trades and daily volume of all equity securities in which transactions took place, sorted by clearing member. The information provided is end-of-day data and is searchable by security name and CUSIP number.⁵⁶ This information is also provided to the Commission upon request. Since the information made available on the report is limited to the date, the clearing firm, and the number of transactions cleared by each clearing firm, its use for regulatory purposes is quite limited—equity cleared reports basically serve as a starting point for certain types of investigations, providing a tool the Commission can use to narrow down the clearing firms

to contact concerning transactions in a certain security.

c. SRO Audit Trails

In addition to EBS data and equity cleared reports, the SROs and the Commission rely on data collected through individual SRO audit trails. Most SROs maintain their own specific audit trails applicable to their members. For example, the National Association of Securities Dealers (“NASD”)⁵⁷ established its Order Audit Trail System (“OATS”)⁵⁸ in 1996, which required NASD (n/k/a FINRA) members to report certain trade and order data on Nasdaq-listed equity securities. OATS was later expanded to include OTC equity securities. Similarly, the NYSE implemented its Order Tracking System (“OTS”)⁵⁹ in 1999 under which its members were required to report certain trade and order data on NYSE-listed securities. Beginning in 2000, several of the current options exchanges implemented the Consolidated Options Audit Trail System (“COATS”).⁶⁰ In addition, many of the exchanges have created their own audit trails to assist in surveillance activities.

Recently, FINRA expanded its OATS requirements from covering only

⁵⁷ In 2007, NASD and the member-related functions of NYSE Regulation, Inc., the regulatory subsidiary of New York Stock Exchange LLC (“NYSE”), were consolidated. As part of this regulatory consolidation, the NASD changed its name to FINRA. See Securities Exchange Act Release No. 56146 (July 26, 2007), 72 FR 42190 (August 1, 2007). FINRA and the National Futures Association (“NFA”) are currently the only national securities associations registered with the Commission; however, the NFA has a limited purpose registration with the Commission under Section 15A(k) of the Exchange Act, 15 U.S.C. 78o–3(k). See also Securities Exchange Act Release No. 44823 (September 20, 2001), 66 FR 49439 (September 27, 2001).

⁵⁸ See *In the Matter of National Association of Securities Dealers, Inc., Order Instituting Public Proceedings Pursuant to Section 19(h)(1) of the Securities Exchange Act of 1934, Making Findings and Imposing Remedial Sanctions*, Exchange Act Release No. 37538 (August 8, 1996), Administrative Proceeding File No. 3–9056 and Report Pursuant to Section 21(a) of the Securities Exchange Act of 1934 Regarding the NASD and The Nasdaq Stock Market LLC (“Nasdaq”). See also Securities Exchange Act Release No. 39729 (March 6, 1998), 63 FR 12559 (March 13, 1998) (order approving proposed rules comprising OATS) (“OATS Approval Order”).

⁵⁹ See Securities Exchange Act Release No. 47689 (April 17, 2003), 68 FR 20200 (April 24, 2003) (order approving proposed rule change by NYSE relating to order tracking) (“OTS Approval Order”).

⁶⁰ See *In the Matter of Certain Activities of Options Exchanges, Administrative Proceeding File No. 3–10282, Securities Exchange Act Release No. 43268 (September 11, 2000) (Order Instituting Public Administrative Proceedings Pursuant to Section 19(h)(1) of the Securities Exchange Act of 1934, Making Findings and Imposing Remedial Sanctions) (“Options Settlement Order”).* See, e.g., Securities Exchange Act Release No. 50996 (January 7, 2005), 70 FR 2436 (order approving proposed rule change by CBOE relating to Phase V of COATS).

Nasdaq-listed and OTC equity securities to covering all NMS stocks.⁶¹ To avoid duplicative reporting requirements, the NYSE, NYSE Amex LLC (n/k/a “NYSE MKT LLC”) (“NYSE Amex”), and NYSE ARCA, Inc. (“NYSE Arca”) subsequently replaced their OTS audit trail requirements for members who are also members of either FINRA or Nasdaq (and therefore subject to OATS requirements) with rules that allow these members to satisfy their reporting obligations by meeting the new OATS requirements.⁶²

Although these developments with respect to the scope of FINRA’s OATS rules reduce the number of audit trails with disparate requirements, they still do not result in a comprehensive audit trail that provides regulators with accurate, complete, accessible, and timely data on the overall markets for which regulators have oversight responsibilities. In particular, data collected by FINRA pursuant to FINRA’s Rule 7400 series (“OATS data”) does not provide a complete picture of the market because though OATS collects data from FINRA members with respect to orders and trades involving NMS stocks, OATS does not include trade or order activity that occurs on exchanges, or at broker-dealers that are not FINRA or Nasdaq members. Nor does OATS include exchange quotes, principal orders submitted by FINRA members registered as market makers, or options data.⁶³ In

⁶¹ See Securities Exchange Act Release No. 63311 (November 12, 2010), 75 FR 70757 (November 18, 2010) (SR–FINRA–2010–044) (order approving proposed rule change by FINRA relating to the expansion of OATS to all NMS stocks).

⁶² See Securities Exchange Act Release Nos. 65523 (October 7, 2011), 76 FR 64154 (October 17, 2011) (SR–NYSE–2011–49); 65524 (October 7, 2011), 76 FR 64151 (October 17, 2011) (SR–NYSEAmex–2011–74); 65544 (October 12, 2011), 76 FR 64406 (October 18, 2011) (SR–NYSEArca–2011–69).

⁶³ See FINRA Rule 7410(j) (defining “Order” for purposes of OATS, to mean “any oral, written, or electronic instruction to effect a transaction in an NMS stock or an OTC equity security that is received by a member from another person for handling or execution, or that is originated by a department of a member for execution by the same or another member, other than any such instruction to effect a proprietary transaction originated by a trading desk in the ordinary course of a member’s market making activities.” Additionally, Nasdaq, Nasdaq OMX BX, Inc. (“BX”) and Phlx equities (“PSX”) members that are registered as market makers in a certain security are similarly exempted from recording OATS audit trail data for the security in which they are registered to make a market. See Nasdaq and BX Rules 6951(i); PSX Rule 3401(i).

The Commission notes that members of Nasdaq, BX and PSX, that are not also members of FINRA, are required by those exchanges to record the audit trail data required by OATS; however, they are only required to report that data through OATS upon request by their respective exchanges. See Nasdaq

⁵³ See, generally, Sections II.A.1. and II.A.2., *infra*.

⁵⁴ See note 2, *supra*, and accompanying text.

⁵⁵ The Commission also uses the Options Cleared Report, with data supplied by the Options Clearing Corporation (“OCC”), for analysis of trading in listed options. The OCC is an equity derivatives clearing organization that is registered as a clearing agency under Section 17A, 15 U.S.C. 78q–1, of the Exchange Act, and operates under the jurisdiction of both the Commission and the CFTC.

⁵⁶ A CUSIP number is a unique alphanumeric identifier assigned to a security and is used to facilitate the clearance and settlement of trades in the security.

performing its own regulatory oversight of the markets, FINRA has chosen to create an internal process in which it augments the data it collects via OATS with trade execution data from other exchanges with which it has a regulatory services agreement. This process provides FINRA with a wider view of the markets than that provided by OATS alone, but linking data in this fashion does not yield fully accurate results.⁶⁴ For these reasons, the Commission believes that the augmented OATS data currently falls short of providing an efficient source of data for analyzing cross-market activities, or tracking an order through its entire cycle from generation through routing to execution, modification or cancellation.

OATS data also suffers from a lack of timeliness, partly as a result of the

and BX Rules 6955(b); PSX Rule 3405(b). Additionally, as of October 17, 2011, members of NYSE and NYSE Amex, who are not also FINRA members, are required to record their trade and order activity. These non-FINRA members are not required to report this data through OATS unless requested. See NYSE and NYSE Amex Equities Rules 7450(b); see, e.g., Securities Exchange Act Release Nos. 65523 (October 7, 2011), 76 FR 64154 (October 17, 2011); 65524 (October 7, 2011), 76 FR 64151 (October 17, 2011); 65544 (October 12, 2011), 76 FR 64406 (October 18, 2011) (notice of immediate effectiveness of proposed rule change to adopt the FINRA Rule 7400 series, the OATS rules, and making certain conforming changes to the NYSE and NYSE Amex Equities rules). Members of NYSE Arca, who are not also FINRA members, were required to record their trade and order activity as of March 31, 2012. See NYSE Arca Equities Rule 7450(b); see Securities Exchange Act Release No. 65544 (October 12, 2011), 76 FR 64406 (October 18, 2011) (notice of immediate effectiveness of proposed rule change to adopt the FINRA Rule 7400 series, the OATS rules, and making certain conforming changes to the NYSE Arca Equities rules). See also Securities Exchange Act 66094 (January 4, 2012), 77 FR 1545 (January 10, 2012) (notice of immediate effectiveness to extend the implementation date of the NYSE Arca Equities Rule 7400 Series, the OATS rules, for Equity Trading Permit Holders that are not FINRA members from January 31, 2012 to March 31, 2012).

⁶⁴ FINRA has represented to Commission staff that, as part of its own surveillance activities, FINRA acquires some of this order handling system data from non-FINRA members to supplement the data it receives from its members via OATS, but that matching data across the audit trails yields varying levels of success and accuracy due to the disparate methods used by the different order handling systems to collect and store data. FINRA represented that, during the period from November 28, 2011 to February 24, 2012, approximately 2% of reportable OATS data related to exchange orders could not be linked with matching exchange data. See Commission Staff Memorandum to File No. S7-11-10 regarding telephone conversations with FINRA, dated April 17, 2012 (“Commission Staff Memorandum”). Also, since this process only involves acquiring trade and order data from select sources, it still does not produce a complete record of all market activity. The Commission notes that, when considering data covering a time period of approximately 26 months, the percentage of reportable OATS data related to exchange orders that could not be linked with matching exchange data remained at approximately 2%. *Id.*

problems with the accuracy of the data as collected, and partly because of its lack of completeness. When FINRA receives an end-of-day OATS file from a member, it takes an hour for FINRA to acknowledge receipt of the report and approximately another 24 hours to determine if there is a syntax error⁶⁵ in the report.⁶⁶ During this time, FINRA performs over 152 validation checks on each order event reported to OATS. Thus, FINRA performs over 40 billion separate checks each day to ensure OATS data conforms to all applicable specifications.⁶⁷ Each of these checks can result in OATS data submissions being rejected and generating an error message.⁶⁸ As a result of these validation checks, almost 425,000 reports per day, on average, are rejected and must be corrected.⁶⁹ In addition to the 24 hours needed to identify errors within a report, it takes another two business days to determine whether a file that is syntactically correct nevertheless contains errors in content related to internally-inconsistent information about processing, linking, and routing orders. Once a member is advised of such errors, the member has up to five business days to re-submit a corrected file. However, error corrections are limited to only those that are required to remedy internal inconsistencies within a given member’s submission. Cross-firm inconsistencies in which, for example, one member reports routing an order to a second member, but the second member does not report receiving or processing such an order, are identified as unmatched or unlinkable data records, but neither firm corrects these types of reporting errors.

⁶⁵ Common reasons given by FINRA for syntax rejections include: Missing mandatory fields, invalid fields, and invalid field combinations (e.g., a Limit Price without a Time in Force Code). OATS will reject records as duplicates if more than one record is submitted with the same Order Receiving Firm Market Participant Identifier, Order Received Date, and Order Identifier or if more than one record contains all of the same information. <http://www.finra.org/Industry/Compliance/MarketTransparency/OATS/FAQ/P085542> (last viewed on May 23, 2012).

⁶⁶ See Commission Staff Memorandum, *supra* note 64. FINRA estimates that, from the period November 28, 2011 to February 24, 2012 approximately 0.10% of the intra-firm data reported daily by broker-dealers were rejected for errors. *Id.* The Commission notes that, when considering data covering a time period of approximately 26 months, the percentage of the intra-firm data reported daily by broker-dealers rejected for errors was more than double this amount. *Id.*

⁶⁷ See FINRA Letter, p. 11. FINRA represented to Commission staff that many of the validation errors result from problems encountered in translating order information from broker-dealer formats into OATS format. See Commission Staff Memorandum, *supra* note 64.

⁶⁸ *Id.*

⁶⁹ *Id.*

The net result yields a historical data record of market activity that contains a small but permanent number of incorrect or irreconcilable trade and order events.⁷⁰

Given the time it takes to process each OATS file, and the nature of the process in which errors are detected, reported back to members, and then corrected, inter-firm surveillance by FINRA typically does not begin until 5 business days after receipt of OATS data. In addition, the final product of the FINRA process is available to FINRA, but is not stored in a market-wide database or a central repository that is readily accessible to other regulators. This is because SROs do not typically have access to the internal systems of another SRO, though they may share some sources of underlying data.⁷¹

Because the Commission does not have direct access to OATS data and other SRO audit trails and because each SRO only has direct access to its own audit trails, requests must be made to the Intermarket Surveillance Group (“ISG”)⁷² or SROs to conduct an analysis on order data. It can take days or weeks, depending on the scope of the information requested, to receive responses to requests. Once the responses to its requests for information are received, the Commission, or any SRO undertaking the same task, must commit a significant amount of time and resources to process and cross-link the data from the various formats used by different SROs before it can be analyzed and used for regulatory purposes. Whether or not this process is successful depends on the accuracy, completeness, and format of the data received, as well as how readily data from different SROs can be reliably linked. For example, staff at the Commission working on the analysis of the May 6, 2010 “Flash-Crash” found it was not possible to use the data from existing audit trails to accurately or comprehensively reconstruct exchange

⁷⁰ FINRA estimates that during the period from November 28, 2011 to February 24, 2012 approximately 0.5% of each day’s reportable events remained unmatched (i.e., multi-firm events, such as routes, that cannot be reconciled). See Commission Staff Memorandum, *supra* note 64. When considering data covering a time period of approximately 26 months, the percentage of each day’s reportable events remaining unmatched was more than double this amount. *Id.*

⁷¹ For example, FINRA has been given access to order audit trail information from certain SROs pursuant to Regulatory Services Agreements.

⁷² ISG is an international group of exchanges, market centers, and regulators that perform market surveillance in their respective jurisdictions. The organization provides a forum for its members to share information and coordinate regulatory efforts to address potential intermarket manipulation and trading abuses.

and ATS equity limit order books for NMS securities as required to fully analyze the events of that day.⁷³

A further difficulty in using existing audit trails to conduct cross-market surveillance is the lack of consistency in both format and content among the various audit trails. Not all SROs collect data using the OATS format. In addition, each options exchange maintains its own COATS audit trail in a different format and includes different supplemental data items in its audit trail. These differences make it difficult and labor intensive for regulators to view options trading activity across multiple markets, and the lack of any combined equity and options audit trail is a significant impediment to regulators performing cross-product investigations and analyses.

An additional shortcoming of existing SRO audit trails is the lack of customer identifiers. In general, existing SRO audit trails only identify the broker-dealer handling the order and not the account holder or the person exercising investment discretion for the account holder, if different. This limitation makes the process of identifying the customers involved in unusual trading patterns or market events very difficult. Even determining whether or not an unusual trading pattern exists is challenging if the data does not identify trades by a single customer at multiple broker-dealers. Requests therefore must be made to one or more broker-dealers to obtain information about the customer or customers behind an order. Multiple requests may be necessary before the information is obtained. EBS data may have to be requested as a supplement. A further challenge arises in any type of customer-based cross-market analysis because there is no standard convention for how customers are identified at different broker-dealers—the same party directing trades across multiple venues, or through different broker-dealers, can be known by many different names.

Not having customer information at the early stage of surveillance can also impair the accuracy, and thus efficacy, of certain surveillances. The patterns that emerge when trade and order activity is aggregated across all customers of a broker-dealer often exhibit characteristics that can be quite different from the (initially) unobservable patterns of trade and order activity of each individual customer at that broker-dealer. This could result in what are known as “false positive signals,” in which market activities that initially are flagged as being potentially

manipulative by a surveillance system are later found not to be potentially manipulative once more detailed customer data from the broker-dealer is requested and analyzed. In contrast, potentially manipulative activities may be missed by a surveillance system that cannot identify the customers behind each order or trade if those activities are otherwise obscured by non-manipulative activities of other customers of the same broker-dealer such that the aggregate patterns of trading do not appear potentially manipulative.

Given the various limitations described above, the Commission does not believe that existing audit trails, with their current features, provide regulators with an efficient or adequate method of monitoring and surveilling the market for NMS securities. The Commission notes, for example, that FINRA summarizes the current cross-market systems as follows: “The current systems in place to achieve effective cross-market surveillance, such as the ISG, are incomplete. For example, the ISG audit trail data has numerous shortcomings, including: (1) It does not capture quote/orders away from a market’s inside market (i.e., those quotes/orders below the best bid or above the best offer); (2) it currently identifies participants of a trade only to the clearing broker, not down to the executing broker level; (3) data submitted by participants is not validated; (4) certain data fields are not mandatory; and (5) there are no service level agreements to ensure that participants submit timely and accurate information.”⁷⁴

2. Regulatory Improvements With a Consolidated Audit Trail

The NMS plan required by the Rule, if approved by the Commission, will improve the quality of audit trail data by, among other things: (1) Identifying with a unique “Customer-ID” the account holder(s) with respect to an account at a registered broker-dealer and, if different, any person authorized to give the broker-dealer trading instructions for such account; (2) identifying the time of each key event in the life of an order according to synchronized business clocks; (3) requiring the reporting of comprehensive order lifecycle data; and (4) including all NMS securities in one audit trail. As discussed below, the Commission believes that these improvements should have the potential to result in the following: (1) Improved market surveillance and investigations;

(2) improved analysis and reconstruction of broad-based market events; and (3) improved market analysis. In addition, a consolidated audit trail has the potential to result in a reduction in disparate reporting requirements and data requests.

a. Improved Market Surveillance and Investigations

A consolidated audit trail will expand the data available for regulators to perform surveillance and investigations for illegal activities such as insider trading, wash sales, or manipulative practices. In particular, a consolidated audit trail will help surveillance and investigations by facilitating risk-based examinations, allowing more accurate and faster surveillance for manipulation, improving the process for evaluating tips, complaints, and referrals (“TCRs”), and promoting innovation in cross-market and principal order surveillance.

i. Risk-Based Examinations

A consolidated audit trail will facilitate risk-based examinations. Risk-based examinations require access to accurate and timely data so that the scope of the examination can be properly set to cover the areas of identified risks. Regulators currently may request audit trail data directly from the broker-dealer, work with the broker-dealer to understand the format and definitions in the data, validate that information with a third party, and analyze the data to determine whether the initial assumptions concerning risk were valid. This effort requires significant resources from both the regulator and the broker-dealer, all of which may be wasted if the resulting analysis shows that the assumptions of risk justifying the examination of a particular subject were not founded. Thus, this resource-intensive process does not necessarily reveal the subjects most worthy of examination, and does not permit an effective pre-examination review of a subject’s trading practices.

In contrast, a consolidated audit trail would permit regulators, for example, to identify risks and appropriate subjects for examinations relating to certain types of trading by creating and comparing metrics based on the complete (and possibly cross-market) activities of a broker-dealer or customer. Signals based on such metrics could, for example, identify outlier patterns in the ratio of order activity to execution, which may be an indication of potentially manipulative practices. Currently, this method is impractical because, as described above, it requires the consolidation of many audit trails

⁷³ See Section II.A.2.b., *infra*.

⁷⁴ See FINRA/NYSE Euronext Letter, p. 3.

that store data in non-uniform formats, participant information in SRO audit trails often does not consistently identify the executing broker-dealer, and there is no uniform method of identifying customers.

In sum, consolidated audit trail data that meets the minimum requirements for the NMS plan specified in the Rule would allow regulators to create a process that focuses much more of their resources on those firms for which specific activities over specific time periods warrant follow up. The subsequent examinations would thus be more precise, resulting in more efficient use of regulatory resources, potentially reducing the need for multiple document requests, and ultimately reducing the sometimes significant compliance burden on a broker-dealer or other subject.

ii. Market Manipulation

In addition to helping regulators focus their resources and better identify areas in which potentially manipulative trading activity may be occurring, a consolidated audit trail will greatly aid the analysis of the potential manipulation itself. The current methodology to analyze order and trade data requires a tremendous amount of time and resources to construct an accurate picture of when trades are actually executed. Typically, this includes: (1) Broker-dealers and other registrants responding to multiple requests from the Commission and SROs; (2) SROs devoting regulatory resources to obtaining, analyzing, and reporting data requested by the Commission; and (3) Commission staff reconciling inconsistent order data provided by different SROs with respect to different markets.

In addition, while SRO audit trail data identifies the dates and times of trades by a particular broker-dealer, SRO audit trail data does not reveal the identities of the customers initiating the trades executed by the broker-dealers. Accordingly, to identify customers placing trades through a broker-dealer, regulatory staff must obtain EBS data and integrate such data with SRO audit trail data. This is a cumbersome process because there is no automated process to link the two data sources. To determine the exact execution time for trades by a particular customer, regulatory staff must obtain a third set of data from the broker-dealer's trading and order handling system. These processes can take many months. In some cases, the laborious process of assembling the data delays other critical investigative or analytical steps. In other cases, investigators or analysts forego

the process of determining when trades occurred, limiting their analysis to more accessible information. As a result, SRO and Commission staffs may fail to ascertain the full scope of misconduct under investigation or the causes of unusual market events at issue.

Even more critically, the absence of reliable information about who initiated which orders makes detection of schemes that involve repeat instances of activity through accounts at multiple broker-dealers difficult. Schemes of this sort may be among the most harmful and difficult to police, but without a customer identifier that consistently and uniquely identifies responsibility for orders across all broker-dealers, no amount of technical sophistication and securities market insight can produce a data query or analysis to detect them.⁷⁵

With the data provided by the consolidated audit trail, regulatory staff would be able to conduct such analyses in a much shorter period of time. In addition, the process of analysis with a consolidated audit trail would be inherently more reliable than the manual reconstruction process currently available, reducing the risk of inaccuracies. Furthermore, the ability to process and meaningfully analyze audit trail data more quickly would allow regulatory staff to employ proactive methods of identifying potentially manipulative activities. The Commission therefore believes a consolidated audit trail would make the overall process of identifying and analyzing potentially manipulative trading practices much more focused, accurate, and efficient.⁷⁶

⁷⁵ Examples of schemes that typically rely on orders from accounts at multiple brokers include: (1) "Network" insider trading schemes in which the participants cultivate multiple sources of non-public information and trade on the information they receive over an extended period of time and through accounts at a large number of broker-dealers; (2) wash trading; and (3) order layering. Unlike insider trading, for example, which is neither defined nor expressly prohibited in the Act, wash trading is specifically prohibited in the statute. The entering of matched orders for the purpose of creating the illusion of market activity or to artificially affect the price is one of the oldest and most difficult to detect manipulative practices. Technology that permits the routing of thousands of orders to different venues in micro seconds has made cross market surveillance for this activity extremely difficult. "Order layering" is similar to wash trading. In this practice, a market participant can enter numerous non-bona fide market moving orders, often in substantial size relative to a security's legitimate volume to create the false impression of buy or sell side pressure. When such orders induce others to execute against profitable limit orders, the market participants immediately cancel the pending orders that manipulated the price. As with wash sales, multiple traders can enter orders on different venues, impacting the NBBO and making the activity difficult to detect.

⁷⁶ For example, implementation of a consolidated audit trail also will help regulators monitor reliance

The timely availability of data to regulators also impacts the efficacy of detecting (and possibly mitigating the effects of) some types of market manipulation. For example, some pernicious trading schemes are designed to generate large "quick-hit" profits in which participants attempt to transfer the proceeds from the activity to accounts outside of the reach of domestic law enforcement as soon as the offending transactions have settled in the brokerage account (typically three days after execution). If the SROs detect such schemes and promptly report them to the Commission, the Commission potentially could seek asset freezes that limit the transfer of funds until charges against the account holder are resolved. The Commission believes that a consolidated audit trail in which uniform data about market activities are efficiently collected and processed soon after such activities occur, and in which data are available to regulators in a timely manner, would more frequently and effectively allow regulators to use this approach.

iii. Tips and Complaints

A consolidated audit trail also would significantly improve the processes used by the SROs and the Commission for evaluating tips and complaints about trading activity.⁷⁷ It is not uncommon for market participants or those with experience in market data to sometimes note atypical trading or quoting patterns in publicly-available market data. A consolidated audit trail would allow regulatory staff to quickly determine whether a particular instance of an atypical activity (regardless of how it was originally identified), such as an abnormally high level of quote traffic, is worthy of further investigation.

Today, such an analysis of TCRs is difficult and cumbersome. Even a preliminary review requires analysis by each exchange or ATS to identify the activity in question and to determine its scope. Regulators then must consolidate the analyses from each such market center to determine the identities of those responsible for the atypical

on the use of the safe harbor provision for issuer repurchases in Rule 10b-18 under the Exchange Act. 17 CFR 240.10b-18. Rule 10b-18 under the Exchange Act provides issuers with a safe harbor from liability for manipulation under Sections 9(a)(2) and 10(b) of the Exchange Act, and Rule 10b-5 under the Exchange Act, when they repurchase their common stock in the market in accordance with the Rule's manner, timing, price, and volume conditions. The data required to be included in the consolidated audit trail will assist regulators in monitoring issuer repurchases that rely on Rule 10b-18's safe harbor protections to ensure that they comply with all required criteria.

⁷⁷ The Commission receives an average of over 200 market-related TCRs each month.

activity in question. To the extent that the activity originates from several market participants, regulators must conduct additional analysis on each of those participants, and possibly other participants, to discover information that could identify the customer(s) originating the orders that created the atypical activity. Without a unique customer identifier included in the order and trade data, this may not be possible. The consolidated audit trail would significantly improve the multi-stage process, enabling regulatory staff to make efficient queries on orders and more quickly determine whether the TCR can be “closed” or if further analysis and investigation are warranted.

iv. Cross-Market and Principal Order Surveillance

Investigations of cross-market activity may be more efficient with a consolidated audit trail as such an audit trail may provide regulators with data not currently consolidated across markets and/or data not currently available to regulators such as broker-dealer principal orders, including market maker quotes. For example, in an attempt to manipulate the market, a broker-dealer could use numerous principal sell orders across multiple venues to give the misleading appearance of broad sell-side pressure, and then send a buy principal order at a favorable price to take advantage of the market momentum created by the misleading sell orders. This type of activity would be difficult to readily identify with current audit trails, but it could be the target of a routine surveillance of a consolidated audit trail. The Commission notes, for example, the statement of FINRA and NYSE Euronext that, “[p]articularly since the implementation of Regulation NMS in 2007, there has been a significant increase in market linkages, the result of which is that trading activity on one market can have a profound effect on other markets. This, in turn, has led to the realization that market manipulation, by its very nature, is facilitated cross-market where, for example, trading on one market is used to affect a security’s price while trading on another market is used to take advantage of that price change.”⁷⁸

In addition, the consolidation of order data with direct access for all relevant regulators may create opportunities for regulators to develop entirely new methods of surveillance, and to keep existing forms of surveillance up to date as new market practices and new market

technologies continue to rapidly evolve. In fact, as described more fully below, SROs are required by the Rule to incorporate the expanded audit trail data into their surveillance systems.⁷⁹

b. Improved Analysis and Reconstruction of Broad-Based Market Events

A consolidated audit trail will significantly improve the ability of regulators to reconstruct broad-based market events so that they and the public may be informed by an accurate and timely accounting of what happened, and possibly why. The sooner a reconstruction can be completed, the sooner regulators can begin reviewing an event to determine what, if any, regulatory responses might be required to address the event in an effective manner.

For example, on the afternoon of May 6, 2010, the U.S. equity and equity futures markets experienced a sudden breakdown of orderly trading, when broad-based indices, such as the Dow Jones Industrial Average Index and the S&P 500 Index, fell about 5% in just five minutes, only to rebound soon after (the “Flash Crash”). Many individual equities suffered even worse declines, with prices in over 300 stocks and exchange-traded funds falling more than 60%. In many of these cases, trades were executed at a penny or less in stocks that were trading at prices of \$30 or more only moments earlier before prices recovered to their pre-Flash Crash levels.⁸⁰

The Commission immediately formed an interdisciplinary team from across the Commission to analyze the events of May 6, 2010, identify possible causes, inform the public of what happened, and aid in formation of regulatory responses. The CFTC took similar steps. Within a few weeks, staff at the Commission and the CFTC released a joint preliminary report that described the event and, in general terms, the market conditions prior to and during the rapid decline.⁸¹ However, at that time the staffs were unable to definitively identify the specific conditions or circumstances that could have caused, contributed to, or exacerbated the event. Though the SROs and the Commission quickly implemented a single-stock circuit breaker pilot program as an initial

response, a more complete regulatory response required a full and robust analysis of additional data.

From the start of the investigation, many market participants had suggested that the sudden withdrawal of liquidity in the equity markets may have resulted in the rapid decline of prices as orders to immediately sell (many from retail investors) found no interest on the buy side (from market professionals).⁸² To fully understand how such conditions could occur, Commission economists needed to analyze the order books for thousands of equities. Commission staff requested order book data from several exchanges that sell such data or could readily put such data together, but this data did not represent the whole market. Commission staff attempted to use order data from OATS and several SRO audit trails to reconstruct order books for thousands of equities traded on exchanges that do not maintain or could not provide order book data. Although it was possible to link the data from different sources to show trading activity for a particular stock over a specific period of time, the accuracy, completeness, and content of the combined data sets were not sufficient to allow for an accurate reconstruction of the order books. This hindered staff in determining what happened to liquidity before, during, and after the Flash Crash. Two major problems were the inability to identify and eliminate duplicate orders from the data and the inability to accurately sequence events across the multiple data sources.

As described in the final joint report issued by the staffs of the CFTC and the Commission on September 30, 2010, Commission staff were only able to create a comprehensive view of the order books by acquiring, processing, and aggregating four distinct data sets that each contained a subset of order book information from each of the four exchanges that could provide such information: Nasdaq ModelView, NYSE Openbook Ultra, NYSE ARCABook, and BATS Exchange.⁸³ Given the enormous volume of data that needed to be processed (more than 5.3 billion records), even small changes to the integration and aggregation process took

⁷⁹ See Rule 613(f).

⁸⁰ See note 45, *supra*.

⁸¹ See “Preliminary Findings Regarding the Market Events of May 6, 2010: Report of the Staffs of the CFTC and the SEC to the Joint Advisory Commission Emerging Regulatory Issues.” (May 18, 2010). See <http://www.sec.gov/sec-cftc-prelimreport.pdf>.

⁸² For detailed discussions and chronologies of the investigation into the events of May 6, 2010, see SEC (<http://www.sec.gov/spotlight/sec-cftcjointcommittee.shtml>) and CFTC (<http://www.cftc.gov/PressRoom/Events/AdvisoryCommitteeMeetings/index.htm>) webcasts and minutes of public meetings held with the Joint CFTC–SEC Advisory Committee on Emerging Regulatory Issues on May 24, 2010, June 22, 2010, August 11, 2010, November 5, 2010, and February 18, 2011.

⁸³ See note 45, *supra*, at p. 11.

⁷⁸ See FINRA/NYSE Euronext Letter, p. 2.

significant computer time to test and implement.

By early July 2010, staff at the CFTC had completed a very detailed analysis of the full order book of the S&P 500 E-Mini futures contract and were able to show how liquidity in that contract had been eroding for most of the day. The CFTC's detailed second-by-second analysis of trading during the Flash Crash itself revealed how buy-side depth in the S&P 500 E-Mini futures virtually evaporated as broad market indices rapidly fell 5%.⁸⁴ However, until a similar analysis could be completed in the equity markets, neither regulators nor the public would know whether an evaporation of liquidity was also present in the equity markets, and whether the timing of such an event preceded or followed the liquidity event in the futures market. Ultimately, it took Commission staff nearly five months to complete an accurate representation of the order books of the equity markets for May 6, 2010. Even then, the reconstruction was not fully complete and only contained an estimated 90% of trade and order activity for that day.⁸⁵ However, it was sufficiently comprehensive to allow staff to perform a robust analysis of the equity markets revealing how "the decline in full-depth buy-side liquidity for the E-Mini precede[d] that of the SPY and [the stocks composing] the S&P 500," and how "drops in [stock] prices [became] increasingly more severe with ever-larger drops in liquidity."⁸⁶

Had there been a consolidated audit trail in place on May 6, 2010, regulators would likely have been able to much more quickly and efficiently perform these types of detailed analyses. This in turn could have dramatically shortened the time during which regulators, as well as the public, remained uncertain about what actually happened during the Flash Crash.

c. Improved Market Analysis

In addition to the surveillance and reconstruction benefits described above, a consolidated audit trail would also significantly improve the ability of regulators to monitor overall market structure, so that both the Commission and the SROs can be better informed in their rulemakings. In January 2010 the Commission published a concept release on equity market structure that discusses how the markets have rapidly evolved from trading by floor-based specialists to trading by high-speed computers. The concept release poses a

number of questions about the role and impact of high-frequency trading strategies and the movement of trading volume from the public national securities exchanges to dark pools.⁸⁷

Over the past two years there has been considerable discussion about these topics by regulators, market participants, the media, and the general public. Nevertheless, numerous open questions remain because of a lack of consolidated market data, making certain types of market-wide analysis impractical. For example, existing research on high frequency trading cannot precisely identify high frequency traders. As a result, studies of high frequency trading have been limited in their ability to thoroughly examine such strategies and their impact on the market, leaving many open questions. Having more precise data on who is trading (and from which general patterns of order submission could be inferred) would help regulators better understand the impact of high frequency trading on markets. Similar analyses also could be performed for other aspects of general market structure, such as those discussed in the concept release related to dark pools and internalization. In addition, having access to a consolidated audit trail will provide the Commission and SROs with better data to conduct retrospective analyses of rules and pilots. Informed analysis of these topics requires consolidating audit trails so that quotes and trades across multiple exchanges can be linked (either by customer type or by specific customer) with order flow and trades from the many dozens of over-the-counter venues.

d. Potential Reduction in Disparate Reporting Requirements and Data Requests

The Commission believes that a consolidated audit trail will reduce the burdens on SROs and broker-dealers associated with producing regulatory data. In particular, the consolidated audit trail may reduce burdens from ad hoc data requests.

The Commission believes that the creation of a consolidated audit trail may reduce the number and types of ad hoc requests made by regulators to market participants for data concerning their trading activities. In particular, regulators could use direct access to data in the consolidated audit trail for investigations or analyzing trends or broad market activities instead of requesting data from market

participants. In addition, regulators could use this direct access to analyze the activities of a single trader across multiple markets, which today requires requests for data from multiple market participants. Regulators would therefore likely make fewer ad hoc requests. The Commission, however, does not believe that all ad hoc requests for data from market participants will be replaced by obtaining data from the consolidated audit trail. A detailed investigation of a particular firm may require types of data from that firm that are not stored in the consolidated audit trail, or that relate to periods prior to the implementation of the consolidated audit trail. In addition, in cases in which there are discrepancies, or even suspected discrepancies, between a firm's actual trading activities and what is stored in the consolidated audit trail's central repository, regulators are likely to request data directly from market participants for verification and investigative purposes.

3. Large Trader Reporting System Rule

The Commission believes that a consolidated audit trail will be able to build upon various aspects of the large trader reporting system that was recently adopted by the Commission.⁸⁸ Rule 13h-1, which establishes the large trader reporting system, requires large traders to identify themselves to the Commission and make certain disclosures to the Commission on Form 13H. Upon receipt of Form 13H, the Commission issues a unique identification number to the large trader, which the large trader then will be required to provide to those broker-dealers through which the large trader trades. Registered broker-dealers will be required to maintain specified transaction records for each large trader and to report that information to the Commission upon request. The Large Trader Rule requirements are designed to enable the Commission to promptly and efficiently identify significant market participants and collect data on their trading activity so that Commission staff can reconstruct market events, conduct investigations and bring enforcement actions as appropriate.

Several commenters noted that portions of the requirements of Rule 13h-1 overlapped with certain provisions of proposed Rule 613 and requested that the Commission harmonize the rules.⁸⁹ One commenter

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.* at p. 18, 80.

⁸⁷ See Securities Exchange Act Release No. 61358 (January 14, 2010), 75 FR 3594 (January 21, 2010) ("Concept Release on Equity Market Structure").

⁸⁸ See note 1, *supra*.

⁸⁹ See ICI Letter, p. 6-7; Liquidnet Letter, p. 4-5; SIFMA Letter, p. 18-19; CBOE Letter, p. 6

Continued

stated that the Commission should consider implementing only those portions of Rule 13h-1 that would not be affected by, or be redundant to, the implementation of the consolidated audit trail proposal.⁹⁰ Another commenter suggested that the Commission mandate compliance only with those aspects of Rule 13h-1 that would operate as part of the consolidated audit trail—the large trader identifier in particular—so they could be leveraged in the creation of the consolidated audit trail.⁹¹ Yet another commenter believed that, upon implementation of the consolidated audit trail, it would not be necessary for large traders to identify themselves to their broker-dealers pursuant to Rule 13h-1, because the consolidated audit trail already would require broker-dealers to include a customer identifier for every order.⁹² The commenter explained that, if customer information is collected as part of the consolidated audit trail, the Commission and SROs could run queries to identify customers with significant trading volume.⁹³

The Commission believes that both Rules are necessary to enhance regulatory oversight of the markets and its members. Key aspects of Rule 13h-1 define the types of entities that are large traders, and who must register with the Commission and file and keep current certain background information on Form 13H. These aspects of Rule 13h-1 are not addressed by Rule 613 and would not be superseded by it. Rather, the information collected by the registration of large traders would further complement the data collected for a consolidated audit trail. To this end, Rule 613 requires that large trader identifiers also be reported to the central repository as part of any large trader's customer account information.⁹⁴

The Commission does note, however, that other aspects of Rule 13h-1 may be superseded by Rule 613. Specifically, the trade reporting requirements of Rule 13h-1 are built upon the existing EBS system. To the extent that, as described in Section II.A.2.iv.d., data reported to the central repository under Rule 613 obviates the need for the EBS system, the Commission expects that the separate reporting requirements of Rule 13h-1 related to the EBS system would be eliminated.⁹⁵

(questioning the need for a large trader reporting system if a consolidated audit trail is implemented).

⁹⁰ See FINRA/NYSE Euronext letter, p. 7.

⁹¹ See SIFMA Letter, p. 18.

⁹² See Liquidnet Letter, p. 5.

⁹³ *Id.*

⁹⁴ See Rule 613(j)(4).

⁹⁵ Though certain reporting requirements of Rule 13h-1 may eventually be unnecessary due to Rule

B. Summary of Proposed Rule 613

Proposed Rule 613 would have required that the SROs propose an NMS plan that included provisions regarding: (1) The operation and administration of the NMS plan; (2) the creation, operation and oversight of a central repository; (3) the data required to be provided by SROs and their members⁹⁶ to the central repository; (4) clock synchronization; (5) compliance by national securities exchanges, FINRA, and their members with Rule 613 and the NMS plan; and (6) a plan for the possible expansion of the NMS plan to products other than NMS securities.

Specifically, proposed Rule 613 would have required the SROs to jointly file an NMS plan with the Commission to govern the creation, implementation, and maintenance of a consolidated audit trail and a central repository.⁹⁷ The NMS plan would have been required to provide for an accurate, time-sequenced record of an order's life, from receipt or origination, through cancellation or execution. In particular, the proposed Rule would have required the NMS plan to require that the SROs and their

613, the Commission notes that Rule 13h-1 will be implemented much more expeditiously compared to the consolidated audit trail, and therefore will address the Commission's near-term need for access to more information about large traders and their activities.

⁹⁶ Section 3(a)(3)(A) of the Exchange Act defines the term "member" to mean: "(i) Any natural person permitted to effect transactions on the floor of the exchange without the services of another person acting as broker; (ii) any registered broker or dealer with which such a natural person is associated; (iii) any registered broker or dealer permitted to designate as a representative such a natural person; and (iv) any other registered broker or dealer which agrees to be regulated by such exchange and with respect to which the exchange undertakes to enforce compliance with the provisions of the [Exchange Act], the rules and regulations thereunder, and its own rules." Section 3(a)(3)(A) further provides that, "[f]or purposes of Sections 6(b)(1), 6(b)(4), 6(b)(6), 6(b)(7), 6(d), 17(d), 19(d), 19(e), 19(g), 19(h), and 21 of [the Exchange Act], the term 'member' when used with respect to a national securities exchange also means, to the extent of the rules of the exchange specified by the Commission, any person required by the Commission to comply with such rules pursuant to Section 6(f) of this title." Finally, Section 3(a)(3)(B) provides that "[t]he term 'member' when used with respect to a registered securities association means any broker or dealer who agrees to be regulated by such association and with respect to whom the association undertakes to enforce compliance with the provisions of [the Exchange Act]." See 15 U.S.C. 78c(a)(3)(A) and 15 U.S.C. 78c(a)(3)(B).

⁹⁷ The proposed Rule would have explicitly required each national securities exchange and national securities association to be a sponsor of the NMS plan submitted pursuant to the Rule and approved by the Commission. See proposed Rule 613(a)(4). "Sponsor," when used with respect to an NMS plan, is defined in Rule 600(a)(70) of Regulation NMS to mean any self-regulatory organization which is a signatory to such plan and has agreed to act in accordance with the terms of the plan. See 17 CFR 242.600(a)(70).

respective members collect and provide to the central repository data for each "reportable event," defined to include the receipt, origination, modification, cancellation, routing, and execution (in whole or in part) of an order, with respect to any NMS security. This data would have been required to be collected and provided to the central repository in a uniform electronic format on a real-time basis.

Under the proposed Rule, the data collected upon the receipt or origination of an order would have included: a unique order identifier; a unique customer identifier;⁹⁸ a unique identifier for the broker-dealer receiving or originating the order; the date and time of receipt or origination of the order; and the "material terms of the order."⁹⁹ For orders that are modified or cancelled, the data collected in real time would have included: The date and time the modification or cancellation was received or originated; the price and remaining size of the order; changes in the material terms of the order (if the order is modified); and the identity of the person giving the modification or cancellation.

For orders that are routed, data collected in real time would have included: The unique order identifier, the date and time the order was routed; The unique identifier of the broker-dealer or national securities exchange routing the order; the unique identifier of the broker-dealer or national securities exchange receiving the order; if routed internally at a broker-dealer, the identity and nature of the department and desk to which the order was routed; and the material terms of the order.

For orders received that were routed, data collected in real time would have included all the information for orders that are routed, except the identity and nature of the department and desk to which the order was routed, if routed internally at a broker-dealer; however,

⁹⁸ Proposed Rule 613(j)(1) would have defined the term "customer" to mean the beneficial owner(s) of the account originating the order and the person exercising investment discretion for the account originating the order, if different from the beneficial owner(s).

⁹⁹ The proposed Rule would have defined "material terms of the order" to include, but not be limited to: The NMS security symbol; security type; price (if applicable); size (displayed and non-displayed); side (buy/sell); order type; if a sell order, whether the order is long, short, or short exempt; if a short sale, the locate identifier, open/close indicator, time in force (if applicable), whether the order is solicited or unsolicited, and whether the account has a prior position in the security; if the order is for a listed option, option type (put/call), option symbol or root symbol, underlying symbol, strike price, expiration date, and open/close; and any special handling instructions. See proposed Rule 613(j)(3).

the date and time the order was routed would be replaced by the date and time the order was received.

For the execution of an order, data collected in real time would have included: the unique order identifier; the date and time of execution; the execution size and price; the unique identifier of the SRO or broker-dealer executing the order; the capacity of the broker-dealer executing the order (*i.e.*, principal, agency, riskless principal); and whether the execution was reported pursuant to an effective transaction reporting plan or the OPRA Plan.¹⁰⁰

Because certain information may not be readily available at the time of the reportable event, the proposed Rule would have required the NMS plan to require each SRO and its members to collect and provide to the central repository certain information, in a uniform electronic format, promptly after receipt of such information, but in no instance later than midnight of the day that the reportable event occurred or when the SRO or its member receives such information. Under the proposed Rule, this data would have included: The account number for any subaccounts to which the execution is allocated (in whole or part); the unique identifier of the clearing broker or prime broker, if applicable; the unique order identifier of any contra-side order; special settlement terms, if applicable; short sale borrow information and identifier; the amount of a commission, if any, paid by the customer, and the unique identifier of the broker-dealer(s) to whom the commission is paid; and, if the execution is cancelled, a cancelled trade indicator.

The proposed Rule would have required that the SROs jointly file an NMS plan with the Commission within 90 days after approval of the Rule. In addition, the SROs would have been required to select a plan processor within two months of the effectiveness of the NMS plan, as well as provide the Commission a document outlining how the SROs would propose to expand the audit trail to include non-NMS securities and additional transactions. The proposed Rule also would have required the SROs to file proposed rule changes to require their members to comply with the requirements of the

proposed Rule and the NMS plan within 120 days of the effectiveness of the NMS plan. The SROs would have been required to begin reporting data to the central repository within one year after the effectiveness of the NMS plan, and their members would have been required to begin reporting data to the central repository within two years after the effectiveness of the NMS plan.

As proposed, the NMS plan would have been required to include specific plan provisions, detailing: The plan governance structure, the processes of admission and withdrawal of plan sponsors, the percentage of votes required to effectuate amendments to the plan, the allocation of central repository costs among the plan sponsors, and the appointment of a Chief Compliance Officer (“CCO”) of the central repository. The proposed Rule would have required all plan sponsors to develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the information contained in the consolidated audit trail. This information would be available to the Commission and the SROs for regulatory and oversight purposes only. The proposed Rule also would have required the NMS plan to require information be collected in a convenient and usable standard electronic data format, directly available and searchable electronically without any manual intervention for a period of not less than five years. This information would have been required to be available immediately, or, if immediate availability was not reasonably and practically achieved, any search query would have to begin operating on the data not later than one hour after the search query was made. Additionally, the proposed Rule would have required the NMS plan to include policies and procedures, including standards, to be utilized by the plan processor to ensure the security and confidentiality of all information submitted to the central repository, and all SROs and their employees, as well as all employees of the central repository, would have been required to agree to use appropriate safeguards to ensure the confidentiality of such data. The proposed Rule also would have required SROs and their members to synchronize their business clocks that are used for the purposes of recording the date and time of any event that must be reported under the proposed Rule consistent with industry standards. Further, the proposed Rule would have required the central repository to collect and retain, on a current and continuing basis, and

in a format compatible with the other information collected pursuant to the proposed Rule, the national best bid and national best offer (“NBBO”) information for each NMS security. Transaction reports reported pursuant to an effective transaction reporting plan filed with the Commission pursuant to, and meeting the requirements of, Rule 601 of Regulation NMS under the Exchange Act,¹⁰¹ and last sale reports reported pursuant to the OPRA Plan filed with the Commission pursuant to, and meeting the requirements of, Rule 608 of Regulation NMS under the Exchange Act also would have been required to be collected and retained.

C. Summary of General Comments on the Proposed Rule

The Commission requested comments on all aspects of the proposed Rule, including the potential costs and benefits.¹⁰² In particular, the Commission encouraged commenters to identify, discuss, analyze, and supply relevant data regarding any such costs or benefits.¹⁰³ In response, commenters provided views and opinions regarding the regulatory usefulness of a consolidated audit trail; the overall costs of the proposed Rule, focusing on those requirements that commenters believed would be the most costly or burdensome to implement;¹⁰⁴ the process for creating and implementing a consolidated audit trail; and alternatives to the proposed Rule’s approach to creating, implementing, and maintaining a consolidated audit trail. These comments are discussed below.

1. Industry Support for a Consolidated Audit Trail

Commenters provided a wide range of opinions, and shared their concerns, regarding specific aspects of the proposed Rule.¹⁰⁵ However, many of the

¹⁰¹ The effective transaction reporting plans include the Consolidated Tape Association Plan (“CTA Plan”) and the Joint Self-Regulatory Organization Plan Governing the Collection, Consolidation and Dissemination of Quotation and Transaction Information for Nasdaq-listed Securities Traded on Exchanges on an Unlisted Trading Privilege Basis (“UTP Plan”).

¹⁰² See Proposing Release, *supra* note 4, at 32586 and 32594.

¹⁰³ *Id.*

¹⁰⁴ For comments on general costs of the proposed Rule, see, e.g., Thomson Reuters Letter, p. 2; Liquidnet Letter, p. 1; CBOE Letter, p. 2; Nasdaq Letter I, p. 2; Angel Letter, p. 1–2; IAG Letter, p. 3.; Kaufman Letter, attachment p. 3; Wells Fargo Letter, p. 4; Noetic Partners Letter, p. 2; Leuchtkafer Letter, p. 1–5; Broadridge Letter, p. 3; SIFMA Letter, p. 1–2; FINRA Letter, p. 3; FINRA Proposal Letter, p. 2.; High Speed Letter, p. 1; Belanger Letter, p. 7–8.

¹⁰⁵ See Section II.C., *infra*, for a discussion of specific concerns raised by commenters.

¹⁰⁰ “The OPRA Plan” is the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information filed with the Commission pursuant to, and meeting the requirements of, Rule 608 of Regulation NMS. The OPRA Plan governs the dissemination of trade and quotation information for listed options. In this capacity, it provides real-time quotation and transaction information to market participants. See 17638 (March 18, 1981), 22 SEC Docket 484 (March 31, 1981) (order approving the OPRA Plan).

commenters and their representatives who are involved with regulating and operating securities markets—as well as many of the commenters who otherwise populate data for, or make use of, existing audit trail systems (such as broker-dealers)—expressed support for the creation of a single consolidated audit trail.

FINRA and NYSE Euronext, filed a joint letter, “vigorously support[ing] the establishment of a consolidated audit trail,” and stating, among other things, that “the evolution of the U.S. equity markets and the technological advancements that have recently taken place have created an environment where a consolidated audit trail is now essential to ensuring the proper surveillance of the securities markets and maintaining the confidence of investors in those markets.”¹⁰⁶

The NASDAQ OMX Group, Inc. similarly states that “[m]arket developments and fragmentation of market centers with varying market structures and levels of transparency have created inefficiencies and potential gaps in cross-market regulation,” and that “[c]omplete transparency is the only way to ensure fair and orderly markets.”¹⁰⁷

Other commenters also stated their general support for the creation of a consolidated audit trail. According to Direct Edge Holdings, LLC (“Direct Edge”), “[t]he proposed consolidated audit trail (‘CAT’) system would significantly enhance the capabilities of regulators to police trading across asset classes; replace existing audit trails and consolidate trading and execution data for the asset classes under the Commission’s jurisdiction * * * enable regulators to create a more complete timeline of an order’s lifecycle; and facilitate large-scale market reconstructions * * *.”¹⁰⁸

Although CBOE expressed some concerns in its comment letter about the “breadth, expense, and timetable of the Proposal”¹⁰⁹ (concerns that were shared by other commenters),¹¹⁰ it “recognizes

there are potential benefits to be obtained from CAT, and agrees that a central repository with uniform data submitted by all markets could enhance SRO and SEC oversight of the markets.”¹¹¹ CBOE further stated that, “[i]n particular, a CAT that contains a customer identifier on an order by order basis would enhance significantly the audit trails of the markets.”¹¹²

BATS Exchange, Inc. (“BATS”) expressed general support for the Commission’s proposal, stating, “[o]ver the last several years, liquidity has dispersed across multiple interconnected venues, such that no one market center can claim a majority share of equity securities transactions. However, regulatory tools have not evolved to keep pace with these changes, and the limited existing processes and data available to analyze inter-market trading are inadequate. As a consequence, regulators rely on inefficient processes to reconstruct inter-market trading activity, including ad hoc requests to members for trading data when a potential problem is identified.”¹¹³

Liquidnet, Inc. (“Liquidnet”), an ATS, generally stated that, “[i]n the long run, a properly-designed system that provides for centralized reporting of data should be more cost-efficient than the current patchwork system for collecting audit trail data.”¹¹⁴ Liquidnet outlined seven specific benefits of a consolidated audit trail, ranging from “[reducing] the time that regulatory personnel must expend to request and collect data from market participants on a case-by-case basis,” to “[reducing] the cost of reconstructing, analyzing, and reporting on significant market events such as those that occurred on May 6, 2010.”¹¹⁵

The Securities Industry and Financial Markets Association (“SIFMA”), an industry group that represents, among other entities, hundreds of securities firms that could be impacted by the creation of a consolidated audit trail, “believes that a centralized and comprehensive audit trail would enable the SEC and securities self-regulatory organizations (‘SROs’) to perform their monitoring, enforcement, and regulatory activities more effectively.”¹¹⁶ SIFMA further states that, “[i]n the current era of electronic trading, regulators need

efficient access to order and execution data from both broker-dealers and exchanges. Indeed, a consolidated audit trail is a much-needed improvement over today’s fragmented audit trail platforms.”¹¹⁷ As did a number of other commenters,¹¹⁸ SIFMA also expressed concerns about, and suggested alternatives to, some specific aspects of the proposed Rule, which will be further discussed below.

Finally, the Commission notes that members of the Financial Information Forum, whose participants include “trading and back office service bureaus, broker-dealers, market data vendors and exchanges,” agree that “an enhanced audit trail system could increase the effectiveness of cross-market surveillance through better data availability and integration.”¹¹⁹

When the perspectives of these commenters are combined with the Commission’s own experiences (as described above in Section II.A.1.c.), a common theme emerges: There is substantial room for improvement in the collection of and access to trading data beyond what is available today from existing audit trails and other sources. The Commission agrees with many of the commenters that one of the main benefits of a consolidated audit trail will be to improve the efficiency and adequacy of a regulatory process of collecting and accessing audit trail data that directly affects and impacts a significant number, and wide variety, of market participants.

2. Commenters’ Views on the Overall Costs of the Proposed Rule and the Resulting Framework of the Adopted Rule

With respect to general costs for the proposal, commenters expressed differing views. As discussed below, some commenters thought that the Commission overestimated the burdens of creating, implementing, and maintaining a consolidated audit trail, while others argued that the Commission had underestimated such burdens.

Nasdaq was among those commenters that stated that the Commission had overestimated the burdens. Specifically, Nasdaq stated that “innovative technology exists to meet many of the Commission’s goals at significantly

¹⁰⁶ See FINRA/NYSE Euronext Letter, p. 1. NYSE Euronext is the publicly traded parent of a number of subsidiaries, including three SROs, NYSE, NYSE Amex, and NYSE Arca.

¹⁰⁷ See Nasdaq Letter I, p. 2. The NASDAQ OMX Group, Inc. is the publicly traded parent of a number of subsidiaries, including three SROs, Nasdaq, Phlx, and BX.

¹⁰⁸ See Direct Edge Letter, p. 1. Direct Edge is the parent of two SROs, EDGA Exchange, Inc. and EDGX Exchange, Inc.

¹⁰⁹ See CBOE Letter, p. 2.

¹¹⁰ See, e.g., Scottrade Letter, p. 1; ICI Letter, p. 4–6; FINRA/NYSE Euronext Letter, p. 4; GETCO Letter, p. 2; BATS Letter, p. 1–2; SIFMA Letter, p. 3–8; Direct Edge Letter, p. 3; FINRA Letter, p. 10–13; Wells Fargo Letter, p. 3; Knight Letter, p. 2–3; Leuchtkafer Letter; Broadridge Letter, p. 3; SIFMA

Proposal Letter, p. 1; FINRA Proposal Letter, p. 3; Liquidnet Letter, p. 3 & p. 5–6; Ameritrade Letter, p. 2–3

¹¹¹ *Id.*

¹¹² *Id.*

¹¹³ See BATS Letter, p. 1.

¹¹⁴ See Liquidnet Letter, p. 1.

¹¹⁵ *Id.* at p. 1–2.

¹¹⁶ See SIFMA Letter, p. 1–2.

¹¹⁷ *Id.* at p. 2.

¹¹⁸ See, e.g., FINRA/NYSE Euronext Letter, p. 7; FINRA Letter, p. 3; FINRA Proposal Letter, p. 1–16; FTEN Letter, p. 1, 4–5; Correlix Letter, p. 2–3; BOX Letter, p. 2; BATS Letter, p. 2.; CBOE Letter, p. 2; Angel Letter, p. 2; Wells Fargo Letter, p. 2; Knight Letter, p. 3; FIF Letter, p. 5–6; Schumer Letter, p. 1.

¹¹⁹ See FIF Letter, p. 1.

lower costs than estimated in the Proposing Release,” and that SROs should be able to weigh the costs and benefits of various designs.¹²⁰ Other commenters also expressed similar opinions stating that a consolidated audit trail accomplishing the Commission’s goals could be implemented for less than the preliminary estimates.¹²¹ Two firms with experience in processing and analyzing market data, FTEN and Thomson Reuters, each noted that current technology could convert data from disparate systems into a uniform format, resulting in a less costly implementation of the consolidated audit trail.¹²² FTEN stated that “currently available commercial systems are capable of immediately accomplishing CAT goals of real-time cross-market transparency, accountability and control with no implementation risk and for far less than the estimated multi-billion dollar price tag.”¹²³ It further suggested that “[t]he SEC should leverage already deployed and commercially available solutions that are in production use today by major market participants * * * .” and an “iterative approach [that] would leverage existing systems to capture order and execution data in real-time from liquidity destinations (exchanges, ECNs, ATNs and dark pools) and ‘map’ the data back to original trade submissions by market participants without requiring integration with, or changes to, market participants systems or to liquidity destination systems and without modifying existing order flow.”¹²⁴ Similarly, another commenter recommended a technology solution that could handle the required data in milliseconds and that “significantly reduces disk space required, which can potentially save millions of dollars when dealing with multiple terabytes of data.”¹²⁵ One commenter suggested an entirely different approach through the use of an “adaptive graph indexing-based architecture” as the basis for the consolidated audit trail platform, instead of using a central repository, and explained that this technology

would keep trading data within each SRO.¹²⁶

On the other hand, numerous commenters expressed general concerns about the costs of implementing a consolidated audit trail relative to the benefits to be gained. For example, one commenter stated that “there can be no doubt whether market regulators need a consolidated audit trail;” however, the commenter questioned whether a system as costly as the consolidated audit trail was necessary to detect violations such as frontrunning, spoofing, and layering, which are violations the Commission has rarely pursued in the recent past.¹²⁷

As discussed above, many commenters expressed general support for the creation of a consolidated audit trail, but believed that, as proposed, the implementation would be too costly and that the Rule should be modified.¹²⁸ Concern about the proposed real-time requirements for reporting data to the central repository was a common theme expressed by these commenters,¹²⁹ including those who maintained that a requirement to provide data on a real-time basis would be too burdensome due to the extensive systems changes that would be needed to comply with such a requirement.¹³⁰ Some of these

¹²⁶ See Belanger Letter, p. 4.

¹²⁷ See Leuchtkafer Letter, p. 4. See also IAG Letter, p. 3.

¹²⁸ See, e.g., SIFMA Letter, p. 2, 15–16; FINRA/NYSE Euronext Letter, p. 7; FINRA Letter, p. 3; Angel Letter, p. 2; CBOE Letter, p. 2–6 (suggesting several ways that the costs of the proposal could be reduced, including: Leveraging existing SRO experience with audit trail systems and imposing uniformity across markets in those systems; requiring the submission of audit trail information through a batch process after the close of the trading day; deleting the requirement that all market maker quotes be submitted to the proposed consolidated audit trail; making clear that broker-dealers have no obligation to report order information that has already been reported to an exchange; and revisiting the need for a large trader reporting system if that proposed rule is adopted.)

¹²⁹ See Scottrade Letter, p. 1; ICI Letter, p. 4–6; FINRA/NYSE Euronext Letter, p. 4; GETCO Letter, p. 2; BATS Letter, p. 1–2; SIFMA Letter, p. 3–8; CBOE Letter, p. 4–5; Direct Edge Letter, p. 3; FINRA Letter, p. 10–13; Wells Fargo Letter, p. 3; Knight Letter, p. 2–3; Leuchtkafer Letter; Broadridge Letter, p. 3; FIF Letter, p. 4; SIFMA Drop Copy Letter, p. 1; Ross Letter, p. 1; FINRA Proposal Letter, p. 3; SIFMA February 2012 Letter; FIA Letter, p. 1–2.

¹³⁰ See Section III.F.2., *infra*; see also, e.g., BATS Letter, p. 1–2; Broadridge Letter, p. 3; FIF Letter, p. 4–5; FINRA/NYSE Euronext Letter, p. 7; FINRA Letter, p. 3; ICI Letter, p. 4–5; Knight Letter, p. 2; Scottrade Letter, p. 1–2; SIFMA Letter, p. 3–6; SIFMA February 2012 Letter. Some commenters also questioned whether the costs to provide data on a real-time basis would outweigh the benefits. See Scottrade Letter, p. 1–2; FINRA/NYSE Euronext Letter, p. 4; GETCO Letter, p. 2; BATS Letter, p. 2; SIFMA Letter, p. 3–8; CBOE Letter, p. 4; FINRA Letter, p. 11–13; Wells Fargo Letter, p. 3; ICI Letter, p. 4–6; GETCO Letter, p. 2; Direct Edge Letter, p. 3; Leuchtkafer Letter; SIFMA Drop Copy Letter, p.

commenters argued that a real-time reporting requirement would require many industry participants to build entirely new systems or undertake significant technological upgrades.¹³¹ SIFMA, in particular, estimated that the cost per broker-dealer to implement real-time reporting could be millions of dollars and that the cost of capturing options quotes in real time alone could exceed the Commission’s \$2.1 billion estimate for the annualized cost of the audit trail.¹³² SIFMA further argued that broker-dealers would incur costs associated not only with establishing and maintaining the infrastructure to support real-time reporting, but also due to regulatory risk if they are not able to achieve 100 percent compliance with the proposed Rule.¹³³ While SIFMA opposed a real-time reporting requirement, and encouraged the Commission to adopt a next day or later reporting requirement,¹³⁴ SIFMA also stated that “if the SEC determines to require reporting of certain data elements in real-time or near real-time, we believe such data should be limited to reporting of ‘key business events.’”¹³⁵ SIFMA further stated that, “if the definition of real-time allowed for reporting within minutes (e.g. 10–15 minutes) of the events, it would be substantially less intrusive on order management systems and may allow for greater flexibility in designing reporting systems architecture and more standardized content for events such as order modifications * * * .”¹³⁶ SIFMA described how a reporting system using “drop copies”¹³⁷ could be “achievable in the relative near term,” although it noted that its proposed process would not, among other things, include a unique Customer ID or a unique order identifier.¹³⁸

Commenters also expressed general concerns regarding the costs of other aspects of the Proposed Rule. For example, Global Electronic Trading Company (“GETCO”), a market maker in equities and equity options, urged the Commission to consider whether quotation information already

1; Ross Letter, p. 1; FINRA Proposal Letter, p. 3; SIFMA February 2012 Letter; FIA Letter, p. 2.

¹³¹ See Scottrade Letter, p. 1–2; ICI Letter, p. 4–5; SIFMA Letter, p. 4; Knight Letter, p. 2. See also Broadridge Letter, p. 3; FIF Letter, p. 4; FIA Letter, p. 2.

¹³² See SIFMA Letter, p. 4–6.

¹³³ *Id.* at p. 5.

¹³⁴ See SIFMA Letter, p. 3–4.

¹³⁵ See SIFMA Drop Copy Letter.

¹³⁶ *Id.*

¹³⁷ A “drop copy” is an electronic copy of a message automatically generated by the existing order management and execution systems used by broker-dealers and SROs.

¹³⁸ See SIFMA Drop Copy Letter.

¹²⁰ See Nasdaq Letter I, p. 2.

¹²¹ See Thomson Reuters Letter, p. 2; Noetic Partners Letter, p. 2; FTEN Letter, p. 1; Ross Letter; Correlix Letter, p. 2.; FINRA Proposal Letter, p. 2.; High Speed Letter, p. 1; Belanger Letter, p. 7–8; Aditat Letter, p. 2 (stating that FIX protocol is already used in the industry today, making it cheaper to create systems to handle consolidated audit trail data as the data already exists in a “suitable format”).

¹²² See FTEN Letter, p. 13; Thomson Reuters Letter, p. 2–3.

¹²³ See FTEN Letter, p. 1.

¹²⁴ *Id.* at p. 3.

¹²⁵ See Know More Software Letter, p. 1.

disseminated by SROs could be reported instead of requiring the SROs and their members to report all quotation information to reduce costs for the industry.¹³⁹ Another commenter, Wells Fargo Advisors, argued that the inclusion of a unique customer identifier would add “tremendous incremental cost to the [consolidated audit trail].”¹⁴⁰

Many commenters provided suggestions and views on how the costs of creating and implementing a consolidated audit trail might be lowered. For example, financial technology firm, Correlix, Inc. (“Correlix”), stated that relying on existing infrastructure, where possible, could bring down the cost and amount of time it would take to implement the consolidated audit trail.¹⁴¹ Correlix further stated that existing technology already is able to provide “a complete end-to-end history of message and order data from the market participant to the execution venue’s matching engine and back to the originator,” and that allows clients to run customized queries and reports on the data.¹⁴²

A variety of commenters, including SROs and broker-dealers, also believed it would be more cost efficient to use the existing OATS infrastructure specifically as a basis for a consolidated audit trail, rather than to purchase or create an entirely new system.¹⁴³ Commenters further argued that existing audit trails could be expanded economically and quickly.¹⁴⁴

In contrast, other commenters expressed the view that costs could be reduced not by using existing audit trail infrastructures, but rather by using new, innovative technology to create the consolidated audit trail.¹⁴⁵ Noetic

Partners, a financial technology firm, explained that technologies are currently available to build a system that would capture “full-depth” data with “compression and near-line storage” in a system that would enable fast retrieval and analysis of data, and opined that, based on existing technology, a consolidated audit trail could be implemented for substantially less than the Commission’s preliminary estimates.¹⁴⁶ This commenter stated that, based on available technology, a fully functional consolidated audit trail could be implemented in months, rather than years, at an initial cost of less than \$100 million.¹⁴⁷

An aggregate analysis of the many specific opinions described above suggests that commenters’ views regarding the costs of creating, implementing, and maintaining a consolidated audit trail fall into one of two general categories. One set of commenters expressed the view that many, if not all, of the requirements of the proposed Rule could be met in a cost-effective fashion if current audit trail systems were replaced with new technologies and systems. However, another set of commenters expressed the view that a number of the requirements of the proposed Rule would be very costly to implement, and, instead, suggested that the most cost-effective method of creating a consolidated audit trail would be to relax some of the proposed requirements and build upon the infrastructure of existing audit trail systems.

Therefore, as discussed above and in detail below,¹⁴⁸ in response to these comments, and specific comments discussed throughout this Release,¹⁴⁹ the Commission is adopting Rule 613 with substantive changes to some of the specific collection, reporting, and data requirements of the Rule.¹⁵⁰ The Commission believes that these changes significantly expand the solutions that could be considered by the SROs for creating, implementing, and maintaining a consolidated audit trail and provide the SROs with increased flexibility in how they choose to meet the requirements of the Rule compared

facility was built to store data and also estimating that “an integrated analysis system combining bespoke software for first-cut filtering of data from the repository, along with [commercial off-the-shelf software] for detailed analysis, could be developed for less than \$10M”. See also Know More Software Letter, p. 1; Belanger Letter, p. 4; FTEN Letter, p. 1, 13.

¹⁴⁶ See Noetic Partners Letter II, p. 2.

¹⁴⁷ *Id.*

¹⁴⁸ See Section I., *supra*.

¹⁴⁹ See, generally, Section III., *infra*.

¹⁵⁰ See Section I., *supra*, for a summary of the changes to proposed Rule 613.

with the requirements of the proposed Rule. For example, the Rule no longer requires real-time reporting¹⁵¹ or only one unique order identifier;¹⁵² thus, the Rule would accommodate an NMS plan based on the types of solutions proposed by SIFMA and FINRA. However, to guide the SROs in their development of the NMS plan, the Rule includes several specific considerations¹⁵³ that the Commission intends to use to evaluate the submitted NMS plan and consider its costs and benefits.

The changes from the Proposing Release provide the SROs with the flexibility to submit an NMS plan that provides creative solutions that harness innovative technology or that build on existing audit trail systems.

3. Comments on the Process for Creating a Consolidated Audit Trail

The Commission received comments regarding the process through which a consolidated audit trail should be created. As proposed, the Rule required that the SROs submit an NMS plan setting forth the details for the creation, implementation, and maintenance of a consolidated audit trail within 90 days of approval of the Rule. A few commenters suggested that more time be allotted for the planning and design of the NMS plan.¹⁵⁴ FIF and the Security Traders Association (“STA”) recommended extensive, “up-front business analysis,”¹⁵⁵ explaining that if conducted “during the CAT plan development process, [they] are confident that issues would emerge earlier in the process, leading to more efficient and cost-effective solutions.”¹⁵⁶ These commenters believed that the business analysis would require many discussions involving the Commission, the SROs and teams comprising members of the securities industry.¹⁵⁷

In this regard, several commenters suggested that the Commission undergo a RFP or request for information (“RFI”) process to create and implement a consolidated audit trail.¹⁵⁸ Specifically, FIF urged the Commission to perform a RFP process “to determine the best technical solution for developing a

¹⁵¹ See Rule 613(c)(3); Section I., *supra*; Section III.B.1.e., *infra*.

¹⁵² See Rule 613(j)(1); Section I., *supra*; Section III.B.1.d.iv., *infra*.

¹⁵³ See Rule 613(a)(1)(i) through (xii); Section I., *supra*; Section III.C.2.a., *infra*.

¹⁵⁴ See FIF Letter II, p. 2–3; STA Letter, p. 2; Nasdaq Letter I, p. 6–7.

¹⁵⁵ See FIF Letter II, p. 1, 3; STA Letter, p. 1, 3.

¹⁵⁶ See FIF Letter II, p. 2; STA Letter, p. 1.

¹⁵⁷ See FIF Letter II, p. 1; STA Letter, p. 1–2.

¹⁵⁸ See FIF Letter, p. 1, 9; FIF Letter II, p. 1–2; STA Letter, p. 2; Direct Edge Letter, p. 2–3, 5.

consolidated audit trail.”¹⁵⁹ FIF suggested that the Commission “should outline a set of goals and guiding principles they are striving to achieve as part of the adopted CAT filing and leave the determination of data elements and other technical requirements to [an] industry working group.”¹⁶⁰ Similarly, Direct Edge suggested that Commission staff should form and engage in a working group to develop an RFP for publication by the Commission.¹⁶¹ DirectEdge explained that an RFP process would facilitate the identification of the costs and benefits of the audit trail, as well as the consideration of a wider range of technological solutions.¹⁶² Further, commenters, including Broadridge Financial Solutions, Inc., a technology provider,¹⁶³ also requested more specific information about the audit trail system to better assess the Commission’s initial cost estimates and to determine the best approach to the consolidated audit trail.¹⁶⁴

To gather the necessary information, commenters argued that the timeframe for submitting an NMS plan should be extended. FIF and STA opined that the time needed to perform the analysis to produce a “detailed blueprint for CAT”¹⁶⁵ would be closer to six months,¹⁶⁶ rather than the proposed 90 days.¹⁶⁷ As a basis for their suggestions, FIF provided a breakdown of the time and the types of work needed for FINRA’s expansion of OATS to all NMS securities.¹⁶⁸ FIF noted that over one-third of the time required for the project was spent on conducting business

analysis, and that one-third of the time was spent on project development.¹⁶⁹

In response to these comments, the Rule requires the SROs to provide more information and analysis to the Commission as part of their NMS plan submission than would have been required under the proposed Rule. As discussed in more detail below, these requirements have been incorporated into the Rule as “considerations” that the SROs must address, and they generally mandate that the NMS plan submitted to the Commission for its consideration discuss certain important features and details of the NMS plan, such as how data will be transmitted to the central repository, as well as an analysis of NMS plan costs and impact on efficiency, competition, and capital formation, the process followed by the SROs in developing the NMS plan, and information about the implementation plan and milestones for the creation of the consolidated audit trail.¹⁷⁰ These requirements are intended to ensure that the NMS plan is the result of a thorough and well-developed plan for creating, implementing, and maintaining the consolidated audit trail, and the Proposing Release highlighted the importance of these types of considerations. In Section III.C. below, the Commission also provides details about how it envisions regulators would use, access, and analyze consolidated audit trail data through a number of “use cases” to help the SROs prepare a sufficiently detailed NMS plan that addresses the requirements of the adopted Rule.¹⁷¹

Because of the additional information and analysis required to be included in the NMS plan, the Commission is extending the amount of time allowed for the SROs to submit the NMS plan. Rule 613(a)(1) provides that “[e]ach national securities exchange and national securities association shall jointly file on or before 270 days from the date of publication of the Adopting Release in the **Federal Register** a national market system plan to govern the creation, implementation, and maintenance of a consolidated audit trail and central repository as required by this section.” The Commission will publish the NMS plan submitted in accordance with Rule 608 of Regulation NMS under the Exchange Act¹⁷² for public comment and will approve the NMS plan if the Commission determines it is necessary or appropriate

in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Act.¹⁷³ The Commission also will consider whether the NMS plan submitted for its consideration would achieve the objectives of the Rule.

4. Comments on Alternatives to the Proposed Consolidated Audit Trail

Several commenters, many of whom generally supported the concept of a consolidated audit trail, recommended alternatives for how a consolidated audit trail should be created, implemented, and maintained. In particular, the Commission received comments suggesting various ways that the OATS system could be modified to serve as the central repository for the consolidated audit trail. FINRA submitted a blueprint for a modified version of OATS that listed certain changes to address the Commission’s proposed requirements for the creation, implementation, and maintenance of the consolidated audit trail.¹⁷⁴ The proposed modifications included, for example, the addition of data elements capturing whether an order was solicited, customer account type, a large trader identifier,¹⁷⁵ and a unique identifier for branch office and registered representative to the data reported to OATS;¹⁷⁶ using OATS to capture order and quote data from all national securities exchanges and eventually OPRA; the inclusion of options, fixed income securities, security-based swaps, principal orders and orders originating in firm-controlled accounts for purposes of working a customer order in OATS; the use of CRD numbers to identify broker-dealers; an exchange data processing gateway for OATS to validate submissions from exchanges; full access to regulators of queryable consolidated audit trail data through the FINRA web portal;¹⁷⁷ and OATS’ acceptance of limited drop-copy report information from broker-dealers on a 15-minute reporting basis.¹⁷⁸

¹⁷³ 17 CFR 242.608(b)(2).

¹⁷⁴ See FINRA Proposal Letter.

¹⁷⁵ See FINRA Proposal Letter, p. 4, 6 (arguing against requiring the name and address of the beneficial owner of an account, as well as of the individual making the investment decision, and against requiring tax identification or social security numbers for individual investors).

¹⁷⁶ *Id.* at p. 7 and Appendix B.

¹⁷⁷ *Id.*

¹⁷⁸ *Id.* at p. 3–4 (noting that this information would be available for query by regulators within one hour of receipt, would include a unique order

Continued

¹⁵⁹ See FIF Letter, p. 1.

¹⁶⁰ See FIF Letter II, p. 2.

¹⁶¹ See Direct Edge Letter, p. 2–3, 5. See also STA Letter, p. 1–3 (recommending the use of working groups comprising the Commission, FINRA, exchanges, broker-dealers, investors, vendors, and institutional asset managers to conduct business analysis and requisite discussions with the industry in planning a consolidated audit trail that meets the Commission’s goals).

¹⁶² *Id.* at p. 3.

¹⁶³ See Broadridge Letter, p. 2.

¹⁶⁴ See Broadridge Letter, p. 2; FIF Letter, p. 8. See also Ross Letter, p. 1 (discussing examples of information security details to consider); Nasdaq Letter I, p. 6 (stating that the proposed Rule provided “incomplete technical information on which design and features make the most sense”).

¹⁶⁵ See FIF Letter II, p. 1–2; STA Letter, p. 2.

¹⁶⁶ See FIF Letter II, p. 2; STA Letter, p. 2–3; see also Nasdaq Letter I, p. 7 (arguing for “scheduling flexibility at the initial stage” of designing the consolidated audit trail).

¹⁶⁷ See proposed Rule 613(a)(1).

¹⁶⁸ See FIF Letter II, p. 3. The commenter also provided the cost to the industry for the expansion of OATS to all NMS stocks—\$48 million. The Commission notes that this is the cost for the project as a whole, not solely for the planning phase, and therefore is not entirely applicable to the cost of the creating and filing the NMS plan required by Rule 613.

¹⁶⁹ The time remaining was spent on “testing and other activities.” See FIF Letter II, p. 3.

¹⁷⁰ See Section III.C.2.a., *infra*.

¹⁷¹ See Section III.C.2.b., *infra*.

¹⁷² 17 CFR 242.608.

However, FINRA's blueprint provided that the large trader identifier should be used initially to identify market participants, as the complexities of tracking retail accounts, the infrequent amount of trading by retail investors, and the large number of such investors make requiring a unique customer identifier difficult.¹⁷⁹

Another commenter from the academic field believed that a modified version of OATS (including fields incorporating ultimate customer account information, a reduction in the time stamp standard to milliseconds or even microseconds, and standardized clock synchronization requirements), coupled with a requirement that exchanges must report to OATS, would allow OATS to fulfill the needs of the consolidated audit trail in a less costly manner than originally proposed.¹⁸⁰ This commenter stated that the Commission's needs could be met by "a few tweaks to the existing trade reports and by extending OATS to cover all NMS stocks and executions at exchanges."¹⁸¹

Several commenters, including SROs and broker-dealers, generally believed that it would be more cost and time efficient to use a form of OATS as a basis for the consolidated audit trail than to purchase or create a new system.¹⁸² For example, FINRA/NYSE Euronext stated that modifying existing systems would reduce both the time and cost to develop a consolidated audit trail, explaining that "the programming changes needed to comply with an entirely new system are substantially greater than expanding existing protocols,"¹⁸³ while BATS suggested

identifier and MPID, and would be added on T+1 to the "order lifecycle" using OATS and TRF data).

¹⁷⁹ *Id.* at p. 4.

¹⁸⁰ See Angel Letter, p. 3 (also noting, "While the OATS data are extremely useful for understanding market behavior and for searching for various violations, these data are not really needed for real time surveillance. Real time surveillance is generally focused on the question of whether or not some change needs to take place immediately * * *. The extensive OATS data regarding the handling of individual orders are more useful for economic analysis and enforcement activities and do not need to be reported in real time.")

¹⁸¹ *Id.*

¹⁸² See FINRA Proposal Letter; BOX Letter, p. 2; BATS Letter, p. 2; CBOE Letter, p. 2-3; Angel Letter, p. 2-3; SIFMA Letter, p. 16-18; Wells Fargo Letter, p. 2; Knight Letter, p. 3; FIF Letter, p. 5-6; Schumer Letter, p. 1; FIA Letter, p. 1-3.

¹⁸³ See FINRA/NYSE Euronext Letter, p. 7. See also FINRA Letter, p. 3 (stating that "the necessary components to an effective, comprehensive, and efficient consolidated audit trail are: (1) Uniform data (both data content and data format); (2) reliable data; and (3) timely access to the data by SROs and the SEC. FINRA believes this can be achieved most effectively, efficiently, and expeditiously by expanding FINRA's existing OATS requirements to additional securities and non-FINRA member

that significant cost savings may be realized by building a consolidated audit trail that "leverages elements of OATS."¹⁸⁴ FINRA/NYSE Euronext also argued that existing audit trails could be expanded "economically and quickly,"¹⁸⁵ noting that use of such systems, such as FINRA's OATS, could make the central repository unnecessary.¹⁸⁶ Similarly, FINRA believed that using OATS as a foundation of the consolidated audit trail would make the consolidated audit trail easier to implement,¹⁸⁷ as opposed to building a new system, which could take years to establish and would likely result in "negative unintended consequences" during development.¹⁸⁸ FIF suggested leveraging FINRA's Trade Reporting and Compliance Engine as a basis for the coverage of debt securities.¹⁸⁹

broker-dealers and by consolidating exchange data in a central repository to be used with OATS data").

¹⁸⁴ See BATS Letter, p. 2.

¹⁸⁵ See FINRA/NYSE Euronext Letter, p. 14; FINRA Letter.

¹⁸⁶ *Id.*

¹⁸⁷ See FINRA Letter, p. 6. Specifically, FINRA proposed enhancements to OATS and outlined a phased approach for implementation. It explained that, under its approach, implementation would begin with equity securities in the first two phases, followed by options in the third and fourth phases. FINRA further proposed that it could "establish an intraday abbreviated order submission capability based on SIFMA's drop-copy proposal." FINRA estimated the initial cost for the first two phases of the OATS enhancement would be between \$100 to \$125 million and the ongoing annual costs to be between \$30 million and \$40 million. While FINRA's proposal appears to include many of the elements required by Rule 613, the Commission notes that the proposal does not include a Customer-ID (which was similarly lacking in the SIFMA proposal), nor would all broker-dealers be required to report order information to the central repository (certain firms that route orders exclusively to another reporting firm that is solely responsible for further routing decisions would be exempt from reporting obligations; additionally, FINRA proposed retaining exemptive authority in certain limited situations to provide relief to small member firms that do not otherwise qualify for exclusion from the definition of an OATS Reporting Member). Further, FINRA's proposal would not collect customers' names, addresses and account numbers. See FINRA Proposal Letter, p. 10; 14-16; Appendix. The Commission believes a unique Customer-ID and customer account information are critical to the efficacy and usefulness of the consolidated audit trail, and therefore is requiring the NMS plan submitted for its consideration to include such information.

¹⁸⁸ *Id.* This commenter also noted that OATS compliance rates have improved to over 99% since the system was first implemented, and emphasized that creating a new system would result initially in low compliance rates until users became familiar with the system. *Id.* at p. 11; see also FINRA/NYSE Euronext Letter, p. 8.

¹⁸⁹ See FIF Letter, p. 6 (also providing thoughts on the functionalities of OATS that should be considered in creating the consolidated audit trail, such as OATS' ability to identify and reject duplicative reporting; to link reports between firms and Nasdaq exchanges without using a unique customer identifier; its possible flexibility in

Two SROs, BOX and CBOE, recommended the joint use of both OATS and COATS.¹⁹⁰ BOX suggested an expansion of OATS and COATS to include customer information,¹⁹¹ and CBOE stated that it believed that certain aspects of OATS and COATS could be combined, with the addition of customer and routing broker information, and new formats.¹⁹² The Commission also received an alternative proposal from a commenter that was not based on OATS, but on a combination of automatically-generated drop-copies and the Financial Information eXchange ("FIX") protocol.¹⁹³ SIFMA urged reporting on a T+1 basis as it believed real-time reporting would require significant changes to existing order management and trading systems.¹⁹⁴ If T+1 reporting were not adopted, however, SIFMA's proposal suggested that certain data be provided to the central repository in near real time, such as data pertaining to "key business events" such as order receipt and origination, order transmittal, execution, modification, and cancellation. SIFMA's proposal listed the specific data elements to be reported for each event, but, to achieve quick implementation, did not include unique customer or order identifiers, or an identifier for algorithmic orders.¹⁹⁵

The Commission has considered the comments on alternative proposals, including those based on OATS, and has made significant modifications to the proposed Rule in light of such comments. Each of these modifications is discussed in detail in Section III. below. But the Commission notes more generally that, as adopted, Rule 613 does not prescribe a specific audit trail collection system or a particular method of data collection to be used for the central repository. In addition, the Commission believes that certain modifications to Rule 613, such as

incorporating additional order types; its current incorporation of quote data; and its current identification of index arbitrage and program trading, and ability to possibly add a large trader identification field "to enhance analysis of high volume, algorithm trading").

¹⁹⁰ See BOX Letter, p. 2; CBOE Letter, p. 2.

¹⁹¹ See BOX Letter, p. 2.

¹⁹² See CBOE Letter, p. 2.

¹⁹³ See SIFMA Drop Copy Letter. The FIX Protocol is a series of messaging specifications for the electronic communication of trade-related messages. It has been developed through the collaboration of banks, broker-dealers, exchanges, industry utilities and associations, institutional investors, and information technology providers from around the world. These market participants share a vision of a common, global language for the automated trading of financial instruments. See <http://fixprotocol.org/what-is-fix.shtml> (last viewed on May 30, 2012).

¹⁹⁴ *Id.* at p. 1.

¹⁹⁵ *Id.* at p. 1-2.

allowing data to be reported by 8:00 a.m. Eastern Time the following trading day, rather than in real time as proposed, provide the SROs with a wider range of options for how they choose to meet the requirements of the adopted Rule compared with the requirements of the proposed Rule. This wider range of options could more easily accommodate an OATS-based approach or other approaches for the creation of a consolidated audit trail, as suggested by commenters, consistent with the requirements of Rule 613.

The Commission notes, however, that OATS, in its current form, has certain limitations and does not include certain attributes that the Commission deems crucial to an effective and complete consolidated audit trail.¹⁹⁶ Some of the limitations of OATS that would need to be addressed to meet the requirements of Rule 613 include:

- At present, only FINRA members are required to report trade and order activity through OATS. The resulting exclusion of some exchange-based and other types of non-member activity could lead to significant gaps in the data as an order is generated, routed, re-routed, and finally executed, canceled, or modified;

- OATS does not currently require the collection of market-making quotes submitted by registered market makers (in those stocks for which they are registered), resulting in further, significant gaps in the data;

- OATS is a part of a process by which FINRA collects data from its members for its own regulatory use. OATS is not a central repository and therefore does not presently provide other regulators with ready access to a central database containing processed, reconciled, and linked orders, routes, and executions ready for query, analysis, or download; and

- OATS does not presently collect options data, and does not afford regulators an opportunity to perform cross-product surveillance and monitoring;

- OATS does not collect information on the identities of the customers of broker-dealers from whom an order is received. As discussed above in Section I., the Commission believes that the integrated inclusion of such data elements into a single consolidated audit trail provides many important regulatory benefits.

III. Discussion

A discussion of each of the key provisions of Rule 613, as adopted, is set forth below.

A. NMS Plan

1. Description of the Rule

a. Implementation of the Consolidated Audit Trail Through an NMS Plan

As proposed, the consolidated audit trail would have been created, implemented, and maintained through an NMS plan approved by the Commission. As proposed, Rule 613(a)(1) would have required each national securities exchange and national securities association to jointly file on or before 90 days from approval of the Rule an NMS plan to govern the creation, implementation, and maintenance of a consolidated audit trail and a central repository.¹⁹⁷ The Commission would then have been required to publish the NMS plan for public comment pursuant to Rule 608 of Regulation NMS under the Exchange Act,¹⁹⁸ and, following the period of public comment, would consider whether or not to approve the NMS plan. In the Proposing Release, the Commission stated its expectation that the exchanges and FINRA would “cooperate with each other and take joint action as necessary to develop, file, and ultimately implement a single NMS plan to fulfill this requirement.”¹⁹⁹

The Commission requested comment on this approach. Specifically, the Commission requested comment on whether requiring the exchanges and FINRA to jointly file an NMS plan that would contain the requirements for a consolidated audit trail was the most effective and efficient way to achieve the objectives of Rule 613, or whether the Commission should require the exchanges and FINRA to standardize or otherwise enhance their existing rules. The Commission further requested comment on which approach would be most efficient in improving the ability to monitor cross-market trading, or to undertake market analysis or reconstructions, and why.

Two commenters discussed how the consolidated audit trail should be created and implemented through an NMS plan.²⁰⁰ One noted that the Rule should provide the SROs with sufficient flexibility to develop an NMS plan that meets the overarching goals of the Commission.²⁰¹ The second suggested that the Rule should “include only the

elements needed for a [consolidated audit trail], and then leave it up to the SROs, [securities information processors] and involved vendors to develop the specifications for the data elements to be specified in the NMS plan, which would ultimately be subject to public comment and SEC approval.”²⁰²

Other commenters objected in principle to the use of an NMS plan to create and implement the consolidated audit trail.²⁰³ One commenter stated that implementing the consolidated audit trail through an NMS plan would be “difficult and inefficient,” given the need “to respond and adapt quickly to new ways of trading and handling orders,” and believed it would be difficult to jointly make necessary technology changes under an NMS plan because, based on the commenter’s experience of collecting data for an existing audit trail, “technology changes and changes to technical specifications must be made regularly and promptly with respect to firm-specific reporting requirements, interpretations, and codes to keep up with complex and evolving trading and routing strategies.”²⁰⁴ Another commenter argued that an NMS plan is “unnecessary * * * given all of the governance issues with NMS plans” because “[t]he Commission can get most of what it needs with a few tweaks to the existing trade reports and by extending OATS to cover all NMS stocks and executions at exchanges.”²⁰⁵

For the reasons discussed below, the Commission continues to believe that an NMS plan filed pursuant to Rule 608 of Regulation NMS²⁰⁶ is the most effective mechanism to implement the consolidated audit trail, and is adopting Rule 613 with a number of modifications and clarifications to address the concerns of commenters.²⁰⁷

The Commission believes that the creation, implementation, and maintenance of the consolidated audit trail through an NMS plan will ensure that the SROs’ expertise as the “front line” regulators of securities markets is drawn upon to develop the details of the consolidated audit trail, and to make appropriate adjustments as warranted to respond to changes in the securities markets and technology going forward.

²⁰² See CBOE Letter, p. 7.

²⁰³ See FINRA Letter, p. 15; Angel Letter, p. 3.

²⁰⁴ See FINRA Letter, p. 15.

²⁰⁵ See Angel Letter, p. 3.

²⁰⁶ See Rule 613(a). The proposed Rule provided that the NMS plan must be filed with the Commission pursuant to Rule 608. Adopted Rule 613(a)(2) clarifies that the NMS plan must also satisfy the requirements set forth in Rule 608(a). See Rule 608(a) of Regulation NMS; 17 CFR 242.608(a).

²⁰⁷ See Section III.C., *infra*.

¹⁹⁷ This Section III.A. discusses the use of a NMS plan to create, implement, and maintain a consolidated audit trail. Section III.C., *infra*, focuses on the process the SROs must follow when submitting the NMS plan to the Commission.

¹⁹⁸ 17 CFR 242.608. See Rule 613(a)(2).

¹⁹⁹ See Proposing Release, *supra* note 4, at 32568.

²⁰⁰ See Thomson Reuters Letter, p. 2; CBOE Letter, p. 7.

²⁰¹ See Thomson Reuters Letter, p. 2.

¹⁹⁶ See Section II.A.1.c., *supra*.

As such, under the Commission's approach, Rule 613 outlines a broad framework for the creation, implementation, and maintenance of the consolidated audit trail, including the minimum elements the Commission believes are necessary for an effective consolidated audit trail. Additionally, Rules 613(a)(1) and (a)(4), which require that each SRO jointly file and be a sponsor of the NMS plan, is being adopted as proposed. The Commission continues to believe that requiring all SROs to jointly file the NMS plan to establish the consolidated audit trail, as opposed to the flexibility provided by current Rule 608 of Regulation NMS under the Exchange Act,²⁰⁸ which permits any two or more SROs to submit an NMS plan, is appropriate because such a requirement is expected to result in an NMS plan that is the product of negotiation and compromise among all of the SROs; in this regard, the NMS plan submitted to the Commission also may be more readily implemented as the NMS plan should take into consideration the capabilities of every SRO.

In response to the commenter that advocated granting additional flexibility to the SROs in developing the requirements of the NMS plan,²⁰⁹ the Commission has made significant modifications to the Rule in several respects to increase the options available to SROs in developing the requirements of the NMS plan.²¹⁰ Furthermore, in instances where Rule 613 sets forth minimum requirements for the consolidated audit trail, the Rule provides flexibility to the SROs to draft the requirements of the NMS plan in a way that best achieves the objectives of the Rule. For example, Rule 613 requires the NMS plan submitted to the Commission for its consideration to require material terms of an order, such as order type, to be collected by the central repository.²¹¹ However, the Rule does not enumerate specific order types or prescribe the format or nature of how this information would be represented. This would be left to the SROs developing the NMS plan and allows flexibility for the future, when new order types may be introduced and added, if appropriate.

Similarly, in response to the commenter stating that implementing the consolidated audit trail through an NMS plan would be "difficult and inefficient" given the need to respond

and adapt quickly to new ways of trading and handling orders,²¹² the Commission notes that, while the NMS plan submitted to the Commission for its consideration must contain the minimum necessary elements for the consolidated audit trail, and any amendments to an effective NMS plan initiated by plan sponsors will require approval by Commission order, the SROs should have flexibility to accommodate a variety of technological and other market developments without amending the NMS plan (e.g., through the issuance and updating of technical specifications that are reasonably and fairly implied by the NMS plan). Underscoring this need to ensure the consolidated audit trail is regularly updated to remain compatible with best market practices, the Commission, as discussed in Section III.C.2.a.i., also has added general requirements to Rule 613 with regards to SROs monitoring and planning for the technological evolution of the consolidated audit trail. Further, as noted in Section III.B.3 below, the NMS plan must include a governance structure for the central repository that is designed to ensure efficient decision-making.

The Commission has also considered the comment that recommended that the Commission should leave it to the SROs, securities information processors ("SIPs") and vendors to develop the specifications for the data elements in the NMS plan.²¹³ The Commission agrees in principle with the commenter, and believes that market participants other than SROs also could have valuable insights regarding the design of the specifications for the data elements, the central repository, and other aspects of the Rule. To address this concern, the adopted Rule requires the SROs to explain in the NMS plan the process by which they solicited views of their members regarding the creation, implementation, and maintenance of the consolidated audit trail, a summary of the views of such members, and how the plan sponsors took such views into account in preparing the NMS plan.²¹⁴ In addition, the Rule requires the NMS plan submitted to the Commission for its consideration to provide for the creation of an Advisory Committee to afford SRO members, and other interested parties as permitted by the NMS plan,²¹⁵ the opportunity to have

input on the creation, implementation, and maintenance of the consolidated audit trail.²¹⁶ The Commission also notes that nothing in the Rule precludes the SROs, as plan sponsors, from consulting with others, including the SIPs and vendors, as they craft the NMS plan. Finally, pursuant to Rule 608(b)(1), the NMS plan will be published for public comment.²¹⁷ Thus, all interested persons, including market participants, regulatory authorities, and the general public, will have an opportunity to provide meaningful comments on the details and costs of the NMS plan submitted to the Commission, which the Commission will review and consider.

In response to the commenter that believed that the objectives of the consolidated audit trail could be achieved "with a 'few tweaks' to the existing trade reports and by extending OATS,"²¹⁸ the Commission notes, as described above, that existing trade reports and the current OATS process combined do not meet many of the requirements the Commission believes are essential for a consolidated audit trail. The Commission therefore believes that an NMS plan, as noted above, provides an effective mechanism for the SROs to create, implement, and maintain a consolidated audit trail meeting such requirements. However, it also notes that the adopted Rule does not preclude the infrastructure, nomenclature, format, or any other aspects of an existing order audit trail system, such as OATS, from being used for the consolidated audit trail, provided the NMS plan proposing to establish such an audit trail otherwise meets the requirements of Rule 613. The Commission stresses that existing order audit trails lack critical information such as the identity of the customer, data on principal orders or quotes, and a way to link orders across markets—information that the Commission believes is essential to the consolidated audit trail.²¹⁹

However, the Commission believes that it is advisable for the SROs to consider including other interested parties such as SIPs, vendors, investors, and/or academics on the Advisory Committee. In addition, the Commission expects that the Advisory Committee would include the Commission's Chief Technology Officer as an observer. See Section III.B.3.b., *infra*.

²¹⁶ See Rule 613(b)(7).

²¹⁷ 17 CFR 242.608(b)(1).

²¹⁸ See Angel Letter, p. 3.

²¹⁹ See Section II.A., *supra*. The Commission notes that, in the Proposing Release, it used the term "proprietary orders" to describe orders that were generated for the account of a broker-dealer. See Proposing Release, *supra* note 4, at 32570.

To avoid confusion with the proposed "Volcker Rule," which proposes new regulations with respect to "proprietary" trading by commercial

²¹² See FINRA Letter, p. 15.

²¹³ See CBOE Letter, p. 7.

²¹⁴ See Rule 613(a)(1)(xi).

²¹⁵ See Rule 613(b)(7)(i). Because members of the SROs will be required to report data pursuant to the NMS plan, the Rule provides that the plan must require that the Advisory Committee include representatives of the member firms of the SROs.

²⁰⁸ 17 CFR 242.608. See Rule 613(a)(2).

²⁰⁹ See Thomson Reuters Letter, p. 2.

²¹⁰ See Section I., *supra*; Sections III.B., III.C., *infra*.

²¹¹ See Section III.B.1.d.i.(A.), *infra*.

B. Elements of the NMS Plan

As discussed above, the adopted Rule requires the SROs to submit an NMS plan to create, implement, and maintain a consolidated audit trail.²²⁰ As adopted, the Rule permits the SROs to consider a wider array of solutions, in creating, implementing, and maintaining a consolidated audit trail. The Rule, however, also sets forth certain minimum requirements of the consolidated audit trail that must be included in the NMS plan submitted by the SROs to the Commission for its consideration. The Commission believes that it is important to set forth certain minimum requirements to ensure that the consolidated audit trail will be designed in a way that provides regulators with the accurate, complete, accessible, and timely market activity data they need for robust market oversight. The minimum audit trail requirements that must be included in the NMS plan submitted by the SROs are discussed below.

1. Recording and Reporting

a. Products and Transactions Covered

As proposed, Rule 613 would have applied to secondary market transactions in all NMS securities, which includes NMS stocks and listed options.²²¹ In the Proposing Release, the Commission also addressed the possibility of expanding the scope of the consolidated audit trail over time. Specifically, proposed Rule 613(i) would have required the NMS plan to include a provision requiring each national securities exchange and national securities association to jointly provide to the Commission, within two months after effectiveness of the NMS plan, a document outlining how such exchanges and associations would propose to incorporate into the consolidated audit trail information with respect to equity securities that are not NMS securities, debt securities, primary market transactions in NMS stocks, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities. The document also would have been required to identify which market participants would be required to provide the additional data and to include an implementation timeline and

banks and their affiliates, the Commission is using the term “principal orders” in this Release to describe orders that were generated for the account of a broker-dealer. See Securities Exchange Act Release No. 65545 (October 12, 2011), 76 FR 68846 (November 7, 2011) (File No. S7-41-11).

²²⁰ See Section 1, *supra*.

²²¹ See proposed Rule 613(c)(5).

a cost estimate for including such data in the consolidated audit trail.²²² The Commission requested comment on whether expanding the consolidated audit trail to include the products and transactions specified above was an appropriate approach to the eventual expansion of the consolidated audit trail, and, if so, an appropriate and realistic timetable for doing so.

Several commenters expressed opinions on the scope of the products and transactions proposed to be covered by the Rule and how their inclusion in the consolidated audit trail should be phased in under the Rule.²²³ One commenter urged the Commission to consider including additional asset classes in the scope of the products covered by the Rule, and specifically questioned the value of the consolidated audit trail without the inclusion of information on futures and other derivatives.²²⁴

The Commission also received comment on the proposed Rule’s approach for considering a possible future expansion of the products and transactions covered by the consolidated audit trail. One commenter believed that its technology would allow development of a platform that would support multiple asset classes and expansion of the consolidated audit trail for use by other regulators.²²⁵ Other commenters expressed general support for expanding the scope of products

²²² The Commission notes that any expansion of the consolidated audit trail to cover non-NMS securities would be effectuated through notice and comment.

²²³ See Liquidnet Letter, p. 2 (suggesting limiting the scope of the first phase of audit trail implementation to end-of-day-reporting to ensure that it can be completed in a timely and cost-effective manner; this commenter also recommended that the first phase apply the consolidated audit trail to all market participants, not just the SROs, as proposed). See also FIF Letter, p. 7 (suggesting that the consolidated audit trail cover just NMS stocks—then at a later date, all NMS securities, including options); FINRA Proposal Letter, p. 5 (suggesting several phases of expansion, beginning with NMS stocks and over-the-counter (“OTC”) equity securities, and ultimately including standardized options, fixed income securities, conventional options, and security-based derivatives in the consolidated audit trail); SIFMA Letter, p. 16–17 (believing that OATS could form the basis for the consolidated audit trail, stating that OATS should be modified to include non-Nasdaq-listed securities, listed options, quotes, street side and exchange-to-exchange routing and market making and recommending phasing in NMS stocks first, then any additional data elements, then listed options and, finally, non-NMS securities); FIF Letter II, p. 2 (suggesting that the consolidated audit trail have “multi-instrument capabilities, most importantly options and futures but also fixed income and other instruments).

²²⁴ See Broadridge Letter, p. 4.

²²⁵ See Nasdaq Letter II, p. 3.

covered.²²⁶ One specifically suggested expanding the scope of the Rule, for example, to include the “creation of instruments that underlie the securities that make up [mortgage-backed securities] and [asset-backed securities].”²²⁷ Another suggested expanding the consolidated audit trail to all securities submitted to an exchange or clearing agency.²²⁸ Yet another commenter, however, argued against allowing the exchanges, through the NMS plan, to have primary responsibility for specifying the data requirements of non-exchange-traded asset classes, stating that exchanges lacked experience with these instruments.²²⁹

The Commission has considered the comments discussed above and is adopting the Rule as proposed with respect to the scope of the securities that must be covered at this time, but, as described below, acknowledges the importance of a mechanism for considering other types of products in the future. Specifically, the adopted Rule requires that consolidated audit trail data be collected for all NMS securities.²³⁰ However, the Commission also is adopting the requirement that the NMS plan require the SROs to jointly submit a document outlining a possible plan for expansion of the consolidated audit trail, as proposed, but with three modifications from the proposed Rule.

Rule 613(i) requires that the SROs jointly provide the Commission a document outlining how the SROs could incorporate the following additional products into the consolidated audit trail: Equity securities that are not NMS securities, debt securities, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities (“expansion document”). The adopted Rule also requires the expansion document to include details for each order and reportable event that may be required to be provided, which market participants may be required to provide the data, an implementation timeline and a cost estimate. The first modification from the proposed Rule is a technical change clarifying that Rule 613(i) is requiring the SROs to provide

²²⁶ See Liquidnet Letter, p. 2; FINRA Proposal Letter, p. 5; SIFMA Letter, p. 16–17; Marketcore Letter, p. 1.

²²⁷ See Marketcore Letter, p. 1.

²²⁸ See Ameritrade Letter, p. 3. See also Mansfield Letter, p. 1 (suggesting other data, including “metrics” and “market environmental information” to be included in the consolidated audit trail).

²²⁹ See Direct Edge Letter, p. 4.

²³⁰ See Proposing Release, *supra* note 4, at 32568–70; Rule 613(c)(5).

the Commission with a document that outlines how an expansion of the consolidated audit trail could be accomplished in the future and is not, at this time, requiring that the SROs commit to expanding the consolidated audit trail beyond secondary market transactions in NMS securities.²³¹ However, the Commission notes that Rule 613(i) retains the requirement that SROs include an implementation timeline and a cost estimate; in this regard, the Commission expects that the SROs will address fully in the expansion document how any such expansion of the consolidated audit trail could be implemented in practice, and that such document would include sufficient detail for the Commission to ascertain how the SROs could proceed with such expansion. The Commission would expect to make the expansion document publicly available on its Web site and to solicit a wide range of comment on it to further inform and facilitate the expansion of the consolidated audit trail if appropriate, taking into account the relevant considerations contemplated by Rule 613(a)(1). In addition, the expansion document could inform the detailed plans that are to be prepared at least every two years by the CCO of the NMS plan.²³²

In addition, after considering the comments received relating to the potential expansion of the consolidated audit trail and how such an expansion might occur,²³³ the Commission is making the second modification to the proposed Rule to extend the deadline for submitting the expansion document from two months to six months from the date of effectiveness of the NMS plan approved by the Commission. The Commission believes that the additional four months will provide the time necessary after the approval of the NMS plan by the Commission for the SROs to consider how they might expand the consolidated audit trail to capture

²³¹ See Rule 613(i). Specifically, Rule 613(i) now provides that the SROs provide a document outlining how such exchanges and associations “could” incorporate non-NMS securities into the consolidated audit trail, rather than how the exchanges and associations “would propose to” incorporate non-NMS securities; and that the exchanges and associations should provide details for each order and reportable event that “may” be required to be provided, and which market participants “may” be required to provide the data. As proposed, the comparable provision of Rule 613(i) required that the exchanges and associations should provide details for each order and reportable event that “would” be required to be provided, and which market participants “would” be required to provide the data.

²³² See Section III.B.3.b., *infra*.

²³³ See Ameritrade Letter, p. 3; Liquidnet Letter, p. 2; Marketcore Letter, p. 1; FINRA Proposal Letter, p. 5; SIFMA Letter, p. 16–17.

orders and trading in these additional securities and thus will aid the Commission in receiving an outline or plan from the exchanges and associations that has had the benefit of additional time for analysis and planning. Finally, given the extension of the deadline for submitting the expansion document and the importance of information regarding primary market information in NMS stocks relative to other types of transactions as discussed in Section III.B.1.a. below, the Commission is removing the requirement that the expansion document discuss all primary market transactions in NMS stocks and is, instead, as discussed later, requiring that a discussion of the feasibility, benefits, and costs of incorporating into the consolidated audit trail information about allocations in primary market transactions in NMS securities be addressed with the NMS plan submission.²³⁴ However, the expansion document must still include a discussion of primary market transactions in equity securities that are not NMS securities.

The Commission agrees in principle with the commenters that advocated a phased approach to implementation.²³⁵ The Commission, however, has determined not to modify the proposed scope of the Rule, which applies to orders in NMS securities. The Commission also adopts substantially its proposed implementation timeframes that apply if and when the NMS plan is approved,²³⁶ except that the NMS plan may provide up to one additional year before small broker-dealers will be required to provide information to the central repository.²³⁷

The Commission continues to believe that the Rule’s requirement to include

²³⁴ See Rule 613(a)(1)(vi). See also Section III.C.2.a.i., *infra*.

²³⁵ See note 222, *supra*.

²³⁶ See Rule 613(a)(3), which states that the NMS plan must require the plan sponsors: (i) Within two months after effectiveness of the NMS plan to select a plan processor; (ii) within four months after effectiveness of the NMS plan to synchronize their business clocks and require the members of each such exchange and association to synchronize their business clocks; (iii) within one year after effectiveness of the NMS plan to provide to the central repository the data specified in Rule 613(c); (iv) within fourteen months after effectiveness of the NMS plan to implement a new or enhanced surveillance system(s) as required by Rule 613(f); (v) within two years after effectiveness of the NMS plan to require their members, except those members that qualify as small broker-dealers as defined in § 240.0–10(c), to provide to the central repository the data specified in Rule 613(c); and (vi) within three years after effectiveness of the NMS plan to require their members that qualify as small broker-dealers as defined in § 240.0–0(c) to provide to the central repository the data specified in Rule 613(c).

²³⁷ See Section III.D., *infra*.

secondary market transactions in all NMS securities (*i.e.*, both listed equities and options) is a reasonable first step in the implementation of the consolidated audit trail. In addition, the Commission believes that applying the Rule solely to NMS securities should allow for a less burdensome implementation of the consolidated audit trail as compared to applying the Rule to a broader set of securities,²³⁸ in large part because market participants already have experience with audit trails for transactions in these securities. And, as discussed in detail above,²³⁹ there are many significant benefits of a consolidated audit trail that includes NMS securities (even if it is only limited to NMS securities).

With regards to a phased approach to implementation, the Commission notes that the data recording and reporting requirements would apply initially, as proposed, to the SROs but not to their members. This will allow members additional time to, among other things, implement the systems and other changes necessary to provide the required information to the central repository, including capturing customer and order information that they may not have previously been required to collect. Should the SROs determine that additional implementation phases might be appropriate (*e.g.*, applying the Rule first to equities and then to listed options), the Commission notes that the Rule does not preclude the SROs from proposing such phases, so long as the outer time parameters specified in the Rule, which the Commission is adopting as proposed, are met.²⁴⁰

The Commission agrees with commenters that the inclusion of additional products (even at a later date) could further enhance the ability of the SROs and the Commission to conduct effective market oversight for financial products currently trading in the marketplace.²⁴¹ The Commission also

²³⁸ The Commission also believes that limiting the application of the Rule initially to only NMS securities should help ensure that the implementation schedule prescribed by the Rule is achievable. See Section III.D., *infra*.

²³⁹ See Section II.A.2, *supra*.

²⁴⁰ See note 223, *supra*.

²⁴¹ The Commission notes that the financial markets have become increasingly interrelated, with transactions occurring in the futures markets affecting transactions in the securities markets. To the extent that instruments other than NMS securities (*e.g.*, futures on a securities index or security-based swaps) can be substitutes for trading in NMS securities, or are otherwise linked to such trading (*e.g.*, as part of a strategy that involves multiple products), having access to an audit trail that includes these instruments would improve regulators’ ability to more quickly detect potentially manipulative or other illegal activity that could

believes that it could be beneficial for the consolidated audit trail to be expanded over a reasonable period of time to include information on primary market transactions in equity and debt securities, as this data could be used to quickly assess potential violations of various rules under the Exchange Act such as, for example, Regulation M and Rule 10b-5.²⁴² For example, the primary

occur across markets. The Commission recognizes, however, that any such expansion to include products not under the Commission's jurisdiction, and thus not contemplated by this Rule, would need to be coordinated with the CFTC or other applicable regulatory authorities, and would likely require a separate rulemaking, which would include a consideration of the costs and benefits of such an expansion. In this regard, the Commission believes that it could be beneficial to discuss with the CFTC, at the appropriate time, the possibility of including within the consolidated audit trail data relating to futures or swap products regulated by the CFTC that are based on securities. The Commission is therefore directing the Commission staff to work with the SROs, the CFTC staff, and other regulators and market participants to determine how other asset classes, such as futures, might be added to the consolidated audit trail. The information from such an expanded consolidated audit trail could benefit both the CFTC and the Commission.

An example of a non-NMS security is a security-based swap. The Commission notes that, separately, it has proposed rules requiring the reporting of security-based swap information to registered security-based swap data repositories ("SDR") or the Commission. See Securities Exchange Act Release No. 63446, File No. S7-34-10 (November 19, 2010), 75 FR 75208 (December 2, 2010) (proposing Regulation SBSR under the Exchange Act providing for the reporting of security-based swap information to registered security-based SDR or the Commission, and the public dissemination of security-based swap transaction, volume, and pricing information); see also Securities Exchange Act Release No. 63447, File No. S7-35-10 (November 19, 2010), 75 FR 77306 (December 10, 2010) (proposing rules governing the SDR registration process, duties, and core principles).

²⁴² See 17 CFR 242.100 *et seq.*; 17 CFR 240.10b-5. Rule 105 of Regulation M prohibits the short selling of equity securities that are the subject of a public offering for cash and the subsequent purchase of the offered securities from an underwriter or broker or dealer participating in the offering if the short sale was effected during a period that is the shorter of the following: (i) Beginning five business days before the pricing of the offered securities and ending with such pricing; or (ii) beginning with the initial filing of such registration statement or notification on Form 1-E or Form 1-E and ending with the pricing. Thus, Rule 105 prohibits any person from selling short an equity security immediately prior to an offering and purchasing the security by participating in the offering.

Rule 10b-5 provides that "[i]t shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce, or of the mails or of any facility of any national securities exchange, (a) [t]o employ any device, scheme, or artifice to defraud, (b) [t]o make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or (c) [t]o engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person, in connection with the purchase or sale of any security."

market transaction data would allow regulators to more quickly identify whether any participant in an offering sold short prior to the offering in violation of Regulation M. The primary market transaction data would allow for identification of the cost basis for purchases by intermediaries and make it easier to assess whether subsequent mark-ups to investors in primary offerings are fair and reasonable and, if not, whether there has been a violation of the antifraud provisions of the federal securities laws, including Rule 10b-5.

The Commission considered the comment letter that agreed that "policing the market requires a comprehensive approach" but asserted the exchanges should not be primarily responsible for specifying requirements relating to asset-backed securities and other debt instruments, including swap instruments that are not exchange-traded.²⁴³ In response, the Commission notes the Rule requires the SROs to submit a document outlining a plan for the possible expansion of the NMS plan to non-NMS securities—namely debt securities and equity securities that are not NMS securities.²⁴⁴ The Commission also notes that FINRA, the SRO responsible for oversight of trading in the over-the-counter market, would participate in the preparation of such expansion document, and expects that FINRA would provide substantial input as to how the consolidated audit trail might be expanded to include non-NMS securities. Because the consolidated audit trail will be jointly owned and operated by the SROs pursuant to the NMS plan, however, the Commission believes that the involvement of all of the SROs in any potential expansion process is appropriate.

The Commission also notes that any expansion of the consolidated audit trail to include transactions in non-NMS securities would be effected through public notice and comment, and take into account the relevant considerations contemplated by Rule 613(a)(1). Furthermore, adopted Rule 613(b)(7), discussed in more detail later in this Release,²⁴⁵ requires the NMS plan to include an Advisory Committee, which includes members of the plan sponsors and other interested parties as set by the NMS plan,²⁴⁶ that would be available to provide consultation on matters concerning the central repository, including the securities subject to the Rule. Therefore, the Commission believes that the participation of FINRA,

the public, and the Advisory Committee should assist the SROs in devising a document outlining the expansion of the consolidated audit trail to other securities.

The Commission continues to believe that the expansion document required by Rule 613(i) will provide valuable information to the Commission and help inform the Commission about the likely efficacy of expanding the scope of the consolidated audit trail to include information on equity securities that are not NMS securities, debt securities, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities. In addition, the expansion document will aid the Commission in assessing the feasibility and impact of the plan sponsors' proposed approach.

The Commission acknowledges that plan sponsors will incur costs to prepare the expansion document. For example, plan sponsors will be required to address, among other things, details for each order and reportable event for which data may be submitted; which market participants may be required to provide the data; an implementation timeline; and a cost estimate. Thus, the plan sponsors must, among other things, undertake an analysis of technological and computer system acquisitions and upgrades that would be required to incorporate such an expansion. The Commission, however, believes that it would be beneficial to receive a document outlining how the plan sponsors could incorporate into the consolidated audit trail securities in addition to NMS securities, such as over-the-counter equity and debt securities, as soon as practicable. This is because such an expansion document will aid the Commission in assessing both the feasibility of expanding the audit trail to these additional securities, possibly including, as commenters urged, instruments that underlie mortgage-backed securities and asset-backed securities, and the resulting potential benefits to the securities markets as a whole if the consolidated audit trail is expanded in the manner described in the document submitted by the plan sponsors pursuant to Rule 613(i).

b. Orders and Quotations

As proposed, Rule 613 would have required that information be provided to the central repository for every order in an NMS security originated or received by a member of an exchange or FINRA. Proposed Rule 613(j)(4) would have defined "order" to mean: (1) Any order received by a member of a national securities exchange or national

²⁴³ See Direct Edge Letter, p. 4.

²⁴⁴ See Rule 613(i).

²⁴⁵ See Section III.B.3.b., *infra*.

²⁴⁶ See note 2145, *supra*.

securities association from any person; (2) any order originated by a member of a national securities exchange or national securities association; or (3) any bid or offer.²⁴⁷ In sum, the Commission proposed that the Rule cover all orders (whether for a customer or for a member's own account), as well as quotations in NMS stocks and listed options.²⁴⁸

The Commission requested comment about the scope of its proposed definition of "order," including whether principal orders²⁴⁹ should be included in the scope of the consolidated audit trail and whether there are any differences between orders and quotations that should be taken into account with respect to the information that would be required to be provided to the central repository. The Commission also requested comment on whether non-firm quotations should be included in the consolidated audit trail and marked to show that they are not firm.²⁵⁰

Commenters generally supported the inclusion of principal orders in the definition of "order,"²⁵¹ but some expressed concern about including market maker quotations in the consolidated audit trail.²⁵² In particular, these commenters thought that the volume of quotes proposed to be collected was so large that it would require market participants to increase the capacity of their systems that would transmit data to the central repository, and thus recommended that market maker quotations be exempted from the Rule's reporting requirements.²⁵³ One of these commenters specifically suggested that the Rule use the same approach as is currently used for the COATS—which contains order, quote (but only the top of market quote) and transaction data for all market participants.²⁵⁴

The Commission also received two comments regarding the inclusion of non-firm orders and quotes in the consolidated audit trail. One commenter, consistent with the proposed Rule, stated that only firm orders and quotes should be

included.²⁵⁵ Another commenter, however, believed that the proposed Rule did not go far enough, and stated that the Rule should require that information relating to indications of interest or similar communications be reported to, among other things, assist the SROs and the Commission in detecting "spoofing,"²⁵⁶ where a market participant enters and quickly cancels limit orders or quotations with the intent of having those non-bona fide orders or quotations change the NBBO or create a misperception of the available market liquidity to induce others to change their trading decisions.

In addition to the comments regarding inclusion of principal and non-firm orders and quotes in the consolidated audit trail, some commenters suggested ways to narrow the definition of "order." One commenter would exempt "non-trading transfers of securities within a legal entity, such as internal journals of securities within a desk or aggregation unit," from the mandatory reporting requirements.²⁵⁷ Another commenter—an options exchange—recommended that the Commission only require consolidated NBBO data to be reported with respect to options quotations, noting that there are millions of quotes per day on its exchange and that certain options, including out-of-the-money options, are subject to a high volume of quotation updates but generate limited trading activity.²⁵⁸

The Commission considered the comments regarding the scope of the quotes and orders that should be included in the Rule's definition of "order," and acknowledges that costs will be incurred by SROs and their members to record and report this information to the central repository and by the central repository to receive, consolidate, store and make accessible such information.²⁵⁹ The Commission also acknowledges that requiring the recording and reporting of all quotes and orders may entail more costs, such as additional development time and storage capacity, than if the Commission did not require the recording and reporting of market maker quotes or out-of-the-money options. Nevertheless, because the Commission continues to

believe that many of the benefits of a consolidated audit trail can only be achieved if all orders and quotations are included, the Commission is adopting the definition of "order" in Rule 613(j)(4) (renumbered as Rule 613(j)(8)), as proposed, to include orders received by a member of an exchange or FINRA from any person, any order originated by a member of an exchange or FINRA, and any bid or offer, including principal orders.²⁶⁰

The Commission believes it is important for the consolidated audit trail to capture information for all principal orders and market maker quotations because principal orders and market maker quotations represent a significant amount of order and transaction activity in the U.S. markets. Effective surveillance of their trading is critical to detecting a variety of types of potential misconduct such as manipulation and trading ahead. By providing regulators comprehensive information about principal orders and market maker quotations throughout the U.S. markets—information that is not available to regulators today using existing audit trails—the consolidated audit trail would allow regulators to efficiently surveil for manipulative and other illegal activity by market making and other proprietary trading firms. In addition, any comprehensive market reconstruction or other market analysis would need to take into account principal orders and market maker quotations—which, as noted above, constitute a large percentage of the orders and trades in today's markets—to provide a complete and accurate picture of market activity.

Furthermore, the Commission believes that including principal orders and market maker quotations in the consolidated audit trail would permit SROs to more efficiently monitor the market for violations of SRO rules. Such monitoring requires determination of the exact sequence of the receipt and execution of customer orders in relation to the origination and execution of principal orders or market maker quotations. For example, SROs would be able to use the consolidated audit trail data to more efficiently detect instances when a broker-dealer receives a customer order and then sends a principal order or quote update to an exchange ahead of the customer order, potentially violating the trading ahead prohibitions in SRO rules.²⁶¹

In addition, information on principal orders or market maker quotations could

²⁴⁷ See Proposing Release, *supra* note 4, at 32570; proposed Rule 613(j)(4).

²⁴⁸ *Id.*

²⁴⁹ See note 219, *supra*.

²⁵⁰ See Proposing Release, *supra* note 4, at 32571.

²⁵¹ See FINRA Letter, p. 10; SIFMA Letter, p. 15; Liquidnet Letter, p. 3; FINRA Proposal Letter, p. 6.

²⁵² See SIFMA Letter, p. 13; CBOE Letter, p. 5.

²⁵³ See SIFMA Letter, p. 13; CBOE Letter, p. 5.

²⁵⁴ See CBOE Letter, p. 5. See also Options Settlement Order, *supra*, note 60. See, e.g., Securities Exchange Act Release No. 50996 (January 7, 2005), 70 FR 2436 (order approving proposed rule change by CBOE relating to Phase V of COATS).

²⁵⁵ See Liquidnet Letter, p. 3.

²⁵⁶ See Ameritrade Letter, p. 3.

²⁵⁷ See SIFMA Letter, p. 15.

²⁵⁸ See BOX Letter, p. 3.

²⁵⁹ Such costs might include the costs to purchase or build new systems and/or costs to modify existing systems to record and report the required data. As discussed in Section I, *supra*, the NMS plan would include detailed information about costs for the public and the Commission to consider.

²⁶⁰ See Rule 613(j)(4).

²⁶¹ See, e.g., FINRA Rule 5320; NYSE Arca Equities Rule 6.16.

be useful in investigating illegal “spoofing.” The availability to regulators of comprehensive information about principal orders and market maker quotations would allow them to more efficiently and effectively identify the source of the orders or quotations and, thus, better determine whether the quoted price was manipulated or simply a response to market forces.

A further example where information on principal orders and market maker quotations would enhance regulatory efforts is in reviewing “layering” or other manipulative activity. Layering is a form of market manipulation where orders are placed close to the best buy or sell price with no intention to trade in an effort to falsely overstate the liquidity in a security. Layering attempts to manipulate the shape of the limit order book to move the price of a security or influence the trading decisions of others. Layering is often effected with principal orders, so inclusion of principal orders in the consolidated audit trail would aid regulators in the detection of this manipulative practice.²⁶²

The Commission considered the comment that recommended excluding certain quotations, such as those generated for out-of-the-money options, from the definition of “orders” required to be reported to the central repository.²⁶³ The Commission, however, believes that such quotations must be included in the consolidated audit trail. Although there may be a high volume of quotations in out-of-the-money options with limited resulting trading activity, the Commission believes that having a record of those quotations is necessary to allow regulators to surveil high-speed quoting strategies for manipulative or other illegal behavior and to assess the impact of market making and other high-frequency quoting behaviors on the quality of the markets. Including these quotations is necessary for example, because the Commission may investigate allegations of a broker-dealer engaging in the practice of flooding the market with out-of-the-money option quotations for the purpose of manipulating the price of the option or related security, or to overload exchange execution systems. Based on the foregoing, to ascertain whether any illegal activity might be occurring through the misuse of quoting, the consolidated audit trail must require all

bids and offers to be collected and reported to the central repository.

The Commission also considered the comment that asserted that “non-trading transfers of securities within a legal entity, such as internal journals of securities within a desk or aggregation unit” should be exempt from the reporting requirements of the Rule.²⁶⁴ In response to this comment, the Commission notes that Rule 613 does not require the reporting of such transfers because they are not “orders,” as defined under Rule 613(j)(8). However, Rule 613 does require the NMS plan to require the reporting of the internal routing of orders at broker-dealers.²⁶⁵

The Commission also considered the comment that recommended including indications of interest in the definition of “order.”²⁶⁶ The Commission, however, is not including indications of interest in the definition of “order” for purposes of the consolidated audit trail because the Commission believes that the utility of the information such data would provide to regulators would not justify the costs of reporting the information. Indications of interest are different than orders because they are not firm offers to trade, but are essentially invitations to negotiate. As such, the Commission believes that indications of interest are less likely to be used as a vehicle for illegal activity, such as manipulation or layering, because they would be less likely to induce a response from other market participants.

c. Persons Required To Report Information to the Central Repository

Under proposed Rule 613(c)(5), each national securities exchange and its members would have been required to collect and provide to the central repository certain data for each NMS security registered or listed on a national securities exchange, or admitted to unlisted trading privileges on such exchange; and, under proposed Rule 613(c)(6), each national securities association and its members would have been required to collect and provide to the central repository certain data for each NMS security for which transaction reports would be required to

be submitted to a national securities association. Proposed Rule 613(c)(7) would have required each national securities exchange, national securities association, and any member of such exchange or association to collect and provide to the central repository certain details, delineated in such Rule, for each order and each reportable event. The Commission requested comment on whether requiring SROs and their members to report the required order information to the central repository was appropriate.

Several commenters broadly objected to the requirement that all broker-dealers report consolidated audit trail information to the central repository and/or proposed alternatives to such a requirement.²⁶⁷ One commenter suggested that introducing brokers should be permitted to rely on their clearing firms for reporting to the central repository, arguing that requiring separate reporting by introducing brokers and clearing firms “will only dilute the economic benefits realized by Introducing Brokers through such clearing arrangements and may result in increased costs to customers.”²⁶⁸ This commenter also stated that it does not believe there is appreciable benefit to the Commission, FINRA or the markets in general in mandating reporting by introducing brokers.²⁶⁹

Similarly, another commenter urged the Commission to exclude broker-dealers from the consolidated audit trail reporting requirements if they route their orders exclusively to another reporting firm that is solely responsible for further routing decisions, on the basis that this would essentially result in duplicative reporting.²⁷⁰ In addition, this commenter recommended the Commission exempt small broker-dealers from the reporting requirements if compliance would be unduly burdensome.²⁷¹ Another commenter, a small broker-dealer that manually handles orders, specifically suggested that the Commission adopt a provision similar to FINRA Rule 7470, which provides FINRA staff the authority to grant exemptions to broker-dealers that solely handle orders manually from

²⁶⁴ See SIFMA Letter, p. 15.

²⁶⁵ See Rule 613(c)(7)(ii)(F). The Commission notes that the NMS plan submitted by the plan sponsors would need to provide appropriate detail as to how orders routed within a single broker-dealer would be reported. For example, the NMS plan would need to address the routing of an order received by a customer-facing sales desk within a broker-dealer to a separate trading or market-making desk within the same broker-dealer that actually determines how to execute the order.

²⁶⁶ See Ameritrade Letter, p. 3.

²⁶⁷ See CBOE Letter, p. 5; TIAA-CREF Letter, p. 2; Wachtel Letter, p. 1; SIFMA Letter p. 13; FINRA Proposal Letter, p. 5–6; GETCO Letter, p. 3–4; Nasdaq Letter II, p. 3.

²⁶⁸ See TIAA-CREF letter, p. 2–3. Another commenter echoed this concern and recommended that the consolidated audit trail develop a means to avoid such duplicative reporting, explaining that this is a problem with the current OATS system. See Wells Fargo Letter, p. 2.

²⁶⁹ See TIAA-CREF letter, p. 2.

²⁷⁰ See FINRA Proposal Letter, p. 5–6.

²⁷¹ *Id.*

²⁶² See Section II.A., *supra*.

²⁶³ See BOX Letter, p. 3.

OATS recording and data transmission requirements.²⁷²

Three commenters argued that broker-dealers should not be required to report quotation information to the central repository that is available from other market participants.²⁷³ Specifically, one commenter argued that broker-dealers should not be required to report information to the central repository that has already been reported to an SRO (e.g., market maker quotes) because the SRO would also be reporting the information to the central repository.²⁷⁴ Another commenter stated that it “believes that, rather than requiring quote reporting by broker-dealers, only the exchanges and FINRA (through its Alternative Display Facility and proposed Quotation Consolidation Facility) should be required to report quotations,” and added that “[t]he exchanges and FINRA are in a position to provide quotation information at a lower cost and with more accuracy.”²⁷⁵ Similarly, a third commenter urged the Commission to consider “whether surveillance systems could rely on quotation information disseminated by the SROs,” instead of requiring all quotation data to be sent separately to the repository.²⁷⁶

The Commission considered the comments objecting to the requirement that broker-dealers report all consolidated audit trail information to the central repository. However, for the reasons discussed below, the Commission is adopting the requirements as proposed with regard to the obligation of members to report required data to the central repository.²⁷⁷ Specifically, the

²⁷² See Wachtel Letter, p. 1. The Commission notes any exemptions granted by FINRA under FINRA Rule 7470 may not exceed a period of two years, unless extended. See FINRA Rule 7470. FINRA’s authority to grant exemptions under FINRA Rule 7470 expires on July 10, 2015. See FINRA Rule 7470(c).

²⁷³ See CBOE Letter, p. 5–6; SIFMA Letter, p. 13; GETCO Letter, p. 3–4.

²⁷⁴ See CBOE Letter, p. 5–6 (stating its belief that “it would be redundant for both the market makers and the exchanges to all submit this information to the CAT. We recommend that the exchanges be permitted to submit information on market maker quotes to the CAT. Market makers who submit quotes to an exchange would have no obligation other than to correctly identify themselves to the exchange as the party submitting the quotation. The exchange could add the rest of the required information (participant identifier, unique order identifier, etc.) to the quote and transmit it to the CAT”).

²⁷⁵ See SIFMA Letter, p. 13.

²⁷⁶ See GETCO Letter, p. 3–4. Another commenter proposed to develop a platform that would collect audit trail information from the SROs and other sources of information, and thus reduce the obligations on broker-dealers to report data. See Nasdaq Letter II, p. 3.

²⁷⁷ See Rules 613(c)(5) through (7).

Commission is adopting Rules 613(c)(5) and (6) as proposed. Rule 613(c)(5) provides that “[t]he national market system plan submitted pursuant to this section shall require each national securities exchange and its members to record and report to the central repository the information required by [Rule 613(c)(7)] for each NMS security registered or listed for trading on such exchange or admitted to unlisted trading privileges on such exchange,” and Rule 613(c)(6) provides that “[t]he national market system plan submitted pursuant to this section shall require each national securities association and its members to record and report to the central repository the information required by paragraph (c)(7) of this section for each NMS security for which transaction reports are required to be submitted to the association.”

In essence, the Commission believes these provisions are appropriate because they require each party—whether a broker-dealer, exchange or ATS—that takes an action with respect to an order, and thus has the best information with respect to that action, to record and report²⁷⁸ that information to the central repository.²⁷⁹ For example, the broker-dealer originating an order—whether received from a customer or generated as a principal order—is in the best position to record the terms of that order, including the time of origination, as well as the unique customer and order identifiers. If the originating broker-dealer is required to record the time each order in a rapid series of principal orders is generated, for example, regulators will be able to more accurately reconstruct the sequence of those orders for purposes of conducting market surveillances for manipulative or other illegal activity, or for performing market reconstructions. In addition, requiring the originating broker-dealer to record the time an order was received from a customer could then help regulators more accurately determine whether the broker-dealer quickly traded ahead of the customer order. On

²⁷⁸ The Commission notes that the Rule does not preclude the NMS plan from allowing broker-dealers to use a third party to report the data required to the central repository on their behalf. In particular, the Commission recognizes that introducing brokers may wish to contract with clearing broker-dealers for this purpose and that the SROs may need to amend their rules to address the allocation of responsibility between the parties. In such cases, the Commission expects that the clearing contract, as mandated by the SRO’s rules, as amended, would address the allocation of responsibility for the reporting of required data.

²⁷⁹ The Commission has adopted Rule 613(c)(5) and (6) using the terms “record” and “report” the required audit trail data, rather than “collect” and “provide” the required audit trail data, as proposed. See also Section III.B.1.e., *infra*.

the other hand, if the recording and reporting requirements initially applied only to the executing or routing broker-dealer, or the exchange in the case of market maker quoting, regulators would not know the precise time the order or quote was originated, and would not be able to implement or perform as efficiently effective surveillances, such as those discussed above. In addition, the lack of precise order origination time could interfere with the ability of regulators to perform accurate market reconstructions or analyses, particularly with respect to high frequency trading strategies. Thus, the Commission believes that every broker-dealer (and exchange) that touches an order must record the required data with respect to actions it takes on the order, contemporaneously with the reportable event, to ensure that all relevant information, including the time the event occurred, is accurately captured and reported to the consolidated audit trail.²⁸⁰

While a broker-dealer will be required to record any actions it takes with

²⁸⁰ The Rule as adopted requires the NMS plan submitted to the Commission for its consideration to require broker-dealers and SROs to record and report to a central repository only the audit trail information for actions each took with respect to an order. For example, if a member receives an order from a customer, the member will be required to report its receipt of that order (with the required information) to the central repository. If the member then routes the order to an exchange for execution, the member will be required to report the routing of that order (with the required information) to the central repository. Likewise, the exchange receiving the routed order will be required to report the receipt of that order from the member (with the required information) to the central repository. If the exchange executes the order on its trading system, the exchange will be required to report that execution of the order (with the required information) to the central repository, but the member will not also be required to report the execution of the order. If the member executes the order in the OTC market, however, rather than routing the order to an exchange (or other market center) for execution, the member will be required to report the execution of the order (with the required information) to the central repository. In this regard, there is no duplicative reporting of audit trail information because each market participant is required to report only the audit trail data for the actions it has taken with respect to an order.

The Commission notes that, for orders that are modified or cancelled, Rule 613(c)(7)(iv) would require the broker-dealer who received the modification from a customer, for example, to report the order modification to the central repository. Thus, if broker-dealer A received a modification to a customer’s order from the customer, broker-dealer A would be required to report such modification to the central repository. If broker-dealer A had already routed the customer’s order to another broker-dealer (“broker-dealer B”), the customer’s modification would also need to be reported by broker-dealer A to broker-dealer B. The receipt of the customer’s modification by broker-dealer B would also need to be reported to the central repository, pursuant to Rule 613(c)(7)(iv). The same reporting obligations would apply if the modification were originated by broker-dealer A.

respect to an order because such recordation would capture information, particularly the time stamp, which is needed by regulators for the reasons discussed above, the Commission notes that nothing in the Rule precludes the NMS plan submitted to the Commission for its consideration from allowing an introducing broker or other broker-dealer to use a third party, such as a clearing broker-dealer, to report the data recorded by the introducing broker or other broker-dealer to the central repository.

The Commission acknowledges that SROs and their members will incur costs to record and report the audit trail data required by Rules 613(c)(5), 613(c)(6) and 613(c)(7).²⁸¹ The Commission also acknowledges that, in some instances, the information required to be recorded and reported by some market participants, for example, market makers, may indeed be available from other market participants (in the case of market makers, the exchanges) and that there might be additional costs for all market participants to record and report information. However, for the reasons noted above, the Commission believes that requiring every market participant that touches an order to record and report the required audit trail data to the central repository, and thus requiring these market participants to incur these costs is appropriate. The Commission believes that such costs will depend on the exact details of how information is to be recorded and reported to the central repository, including whether third-parties, such as clearing-brokers or exchanges, facilitate the transmission of such data. But because these costs depend on details that are not being prescribed by the Commission, Rule 613 requires that the SROs must, in their proposal of the specific mechanisms by which data will be reported to the central repository, include cost estimates of their solution, as well as a discussion of the costs and benefits of the various alternatives considered but not chosen.²⁸² More so, as discussed above in Section I, once the Commission receives the submitted NMS plan, it will be able to use such plan-specific details and costs estimates, as well as public comment on the NMS plan, in determining whether to approve the NMS plan.

²⁸¹ Such costs might include the costs to purchase or build new systems and/or costs to modify existing systems to record and report the required data. As discussed in Section I, *supra*, the NMS plan would include detailed information about costs for the public and the Commission to consider.

²⁸² See Section III.C.2.iii., *infra*.

The Commission also considered the comment that small broker-dealers should be granted an exemption from the Rule,²⁸³ and, as discussed in Section III.D., is adopting Rule 613(a)(3)(vi), which provides that the NMS plan shall require each SRO to require small broker-dealers to provide audit trail data to the central repository within three years after effectiveness of the NMS plan, as opposed to within two years as proposed.²⁸⁴ The Commission believes that completely exempting small broker-dealers from reporting requirements would be contradictory to the goal of Rule 613, which is to create a comprehensive audit trail. In effect, an exemption to small broker-dealers from the requirements of the Rule would eliminate the collection of audit trail information from a segment of the broker-dealer community and would thus result in an audit trail that does not capture all orders by all participants in the securities markets for NMS securities. The Commission notes that illegal activity, such as insider trading and market manipulation, can be conducted through accounts at small broker-dealers just as readily as it can be conducted through accounts at large broker-dealers. In addition, granting an exemption to certain broker-dealers might create incentives for prospective wrongdoers to utilize such firms to evade effective regulatory oversight through the consolidated audit trail. The Commission recognizes, however, that small broker-dealers, particularly those that operate manual systems, might be particularly impacted because of their more modest financial resources and may need additional time to upgrade to an electronic method of reporting audit trail data to the central repository, and thus believes that allowing the NMS plan to permit such broker-dealers up to an extra year to begin reporting data to the central repository if the plan sponsors believe such an accommodation is reasonable, is appropriate. The Commission believes up to an additional year could allow small broker-dealers extra time to explore the most cost-effective and most efficient method to comply with the Rule. The Commission acknowledges that permitting small broker-dealers up to three years to begin reporting the required audit trail data to the central repository will delay the ability of regulatory authorities to obtain full information about all orders from all participants, which in turn will result in delaying the full regulatory benefit of the consolidated audit trail. However,

²⁸³ See Wachtel Letter, p. 1.

²⁸⁴ See Section III.D., *infra*.

the Commission believes that such an accommodation to small broker-dealers is reasonable, given the fact that small broker-dealers may face greater financial constraints in complying with Rule 613 as compared to larger broker-dealers.²⁸⁵ The Commission also notes that many small broker-dealers are introducing broker-dealers and may be able to use their clearing broker-dealers to report the data to the central repository, thereby potentially reducing some of their costs.

d. Reportable Events and Consolidated Audit Trail Data Elements

As proposed, Rule 613 would have required SROs and their respective members to provide certain information regarding each order and each "reportable event" to the central repository. A reportable event would have been defined in proposed Rule 613(j)(5) to include, but not be limited to, the receipt, origination, modification, cancellation, routing, and execution (in whole or in part) of an order.

For the reportable event of receipt and origination of an order, proposed Rule 613(c)(7)(i) would have required the reporting of the following data elements: (1) Information of sufficient detail to identify the customer; (2) a unique customer identifier for each customer; (3) customer account information; (4) a unique identifier that would attach to an order at the time of receipt or origination by the member; (5) a unique identifier for the broker-dealer receiving or originating an order; (6) the unique identifier of the branch office and registered representative receiving or originating the order; (7) the date and time (to the millisecond) of order receipt or origination; and (8) the material terms of the order.

For the reportable event of routing of an order, proposed Rule 613(c)(7)(ii) would have required the reporting of the following information by the member or SRO that is doing the routing, each time an order is routed: (1) The unique order identifier; (2) the date on which an order was routed; (3) the exact time (in milliseconds) the order was routed; (4) the unique identifier of the broker-dealer or national securities exchange that routes the order; (5) the unique identifier of the broker-dealer or

²⁸⁵ If a clearing broker-dealer receives an order from a small broker-dealer during the period between the time the Rule is applicable to large broker-dealers and the time the Rule is applicable to small broker-dealers, the broker-dealer performing the clearing function for the small introducing broker will be subject to only the requirements of the Plan applicable directly to the clearing broker-dealer, while the small introducing broker will not be subject to the reporting requirements at that time.

national securities exchange that receives the order; (6) the identity and nature of the department or desk to which an order is routed if a broker-dealer routes the order internally; and (7) the material terms of the order.

Rule 613(c)(7)(iii), as proposed, also would have required the collection and reporting by the SRO or member receiving a routed order of the following information: (1) The unique order identifier; (2) the date on which the order is received; (3) the time at which the order is received (in milliseconds); (4) the unique identifier of the broker-dealer or national securities exchange receiving the order; (5) the unique identifier of the broker-dealer or national securities exchange routing the order; and (6) the material terms of the order.

For the reportable events of modification or cancellation of an order, proposed Rule 613(c)(7)(iv) would have required the following data be collected and reported: (1) The date and time (in milliseconds) that an order modification or cancellation was originated or received; (2) the price and remaining size of the order, if modified; (3) the identity of the person responsible for the modification or cancellation instruction; and (4) other modifications to the material terms of the order.

For full or partial executions of an order, proposed Rule 613(c)(7)(v) would have required the following information to be collected and reported to the central repository: (1) The unique order identifier; (2) the execution date; (3) the time of execution (in milliseconds); (4) the capacity of the entity executing the order (whether principal, agency, or riskless principal); (5) the execution price; (6) the size of the execution; (7) the unique identifier of the national securities exchange or broker-dealer executing the order; and (8) whether the execution was reported pursuant to an effective transaction reporting plan or pursuant to the OPRA Plan.

The Commission received comments on the information proposed to be recorded and reported to the central repository for each reportable event (*i.e.*, the consolidated audit trail data elements) but did not receive comments on the proposed definition of reportable event in proposed Rule 613(j)(5) (*i.e.*, the events that trigger consolidated audit trail reporting requirements). However, the Commission is making clarifying changes to proposed Rule 613(j)(5) (renumbered as Rule 613(j)(9)) to define a “reportable event” as including the original receipt of a customer’s order by a broker-dealer; the origination of an order by a broker-dealer (*i.e.*, a principal order); and the

receipt of a routed order. Thus, Rule 613(j)(9), as adopted, provides that “[t]he term reportable event shall include, but not be limited to, the original receipt or origination, modification, cancellation, routing, and execution (in whole or in part) of an order, and receipt of a routed order.” The Commission believes these changes from the proposal are appropriate because they conform Rule 613(j)(9) to the provisions of Rule 613(c)(7). Specifically, Rule 613(c)(7) is structured around each “reportable event;” therefore, audit trail data is listed according to the data that must be reported upon “original receipt or origination” of an order (Rule 613(c)(7)(i)); “routing” of an order (Rule 613(c)(7)(ii)); “receipt of an order that has been routed” (Rule 613(c)(7)(iii)); “modification or cancellation” of an order (Rule 613(c)(7)(iv)); and “execution” of an order (Rule 613(c)(7)(v) and (vi)).

As noted above, the Commission received comments on the information proposed to be recorded and reported to the central repository with each reportable event (*i.e.*, the consolidated audit trail data elements) and, in response, is adopting the Rule with certain modifications from the proposed Rule with respect to certain of the consolidated audit trail data elements. In so adopting the Rule, the Commission acknowledges that costs will be incurred by SROs and their members to record and report this information to the central repository and by the central repository to receive, consolidate, store and make accessible such information.²⁸⁶ However, the Commission believes that the costs to SRO members for reporting this information, and the costs to the central repository for collecting and storing this information, will significantly depend on the exact details of how this information will be gathered and transmitted by the various types of market participants covered by Rule 613. The Commission is therefore requiring the SROs to include as part of the NMS plan submitted to the Commission for its consideration pursuant to the Rule, details of how each of the different data elements would be recorded, reported, collected,

²⁸⁶ In particular, the Commission acknowledges that certain elements are not collected by existing audit trails and thus SROs and members would incur additional costs to record and report such information. The Commission also acknowledges that there might be additional costs with respect to assigning customer identifiers, the broker-dealer identifiers and the order identifiers because such assignments might, depending on the NMS plan, require coordination amongst various different entities and possibly further systems changes.

and stored, as well as cost estimates for the proposed solution, and a discussion of the costs and benefits of alternate solutions considered but not proposed. The Commission also notes that the SROs are not prohibited from proposing additional data elements not specified in Rule 613 if the SROs believe such data elements would further, or more efficiently, facilitate the requirements of the Rule.

Once the SROs have submitted an NMS plan with these details, the Commission will be able to use this information to determine whether to approve the NMS plan. The Commission at this time is only directing the SROs to develop and submit a detailed NMS plan that includes each of the data elements. The Commission is not making a final determination of the nature and scope of the data elements to be included in the consolidated audit trail—as discussed above, these determinations will be made after the SROs submit the NMS plan, and the Commission and public have had an opportunity to consider the proposed data elements.

Rather, at this time the Commission is only making a more limited determination. The benefits the Commission and the public will receive from being able to consider the detailed costs and benefits of the specific set of data elements submitted to the Commission for its consideration pursuant to the Rule justify the costs of preparing the NMS plan with such data elements included.

A discussion of these consolidated audit trail data elements follows.

i. Material Terms of the Order

As proposed, Rule 613 would have required broker-dealers to report the material terms of the order upon origination or receipt of an order and upon routing, modification, and cancellation of an order.²⁸⁷ Proposed Rule 613(j)(3) (renumbered as Rule 613(j)(7)) defined material terms of the order to include, but not be limited to, the following information: (1) The NMS security symbol; (2) the type of security; (3) price (if applicable); (4) size (displayed and non-displayed); (5) side (buy/sell); (6) order type; (7) if a sell order, whether the order is long, short, or short exempt; ²⁸⁸ (8) if a short sale,

²⁸⁷ See proposed Rules 613(c)(7)(i)(I), 613(c)(7)(ii)(G), 613(c)(7)(iii)(F), and 613(c)(7)(iv)(D).

²⁸⁸ A broker or dealer currently must mark all sell orders of any equity security as long, short, or short exempt. See Rule 200(g)(1) under the Exchange Act, 17 CFR 242.200(g)(1). A sell order may be marked short exempt only if the conditions of Rule 201(c) or (d) under the Exchange Act are met (17 CFR

the locate identifier; (9) open/close indicator; (10) time in force (if applicable); (11) whether the order is solicited or unsolicited; (12) whether the account has a prior position in the security; (13) if the order is for a listed option, option type (put/call), option symbol or root symbol, underlying symbol, strike price, expiration date, and open/close; and (14) any special handling instructions.

The Commission requested comment on whether there are any items of information that are required to be recorded and reported by existing audit trail rules, or to be provided to the SROs or the Commission upon request, that were not proposed but should have been included in the Rule. One commenter suggested that two data elements be added to aid regulators in detecting the original source of orders that violate laws or are involved in market manipulations.²⁸⁹ Specifically, this commenter recommended that the proposed Rule should capture the identity of the individual who originated the order (in addition to identifying the firm) and the system he or she used to originate the order.²⁹⁰ Another commenter questioned the need for information regarding whether an account has a prior position in a security.²⁹¹ The commenter expressed skepticism about the value of knowing, in real time, whether the customer has a prior position in the security, since the length of time the position has been held would not be captured. This commenter also questioned how the Commission's requirement that the prior position in a security be reported would work in the situation where a client has multiple accounts but it is the first time the client has opened a position in one of the accounts.²⁹² Another commenter provided specific information on the exact data elements that it could incorporate into the consolidated audit trail if it were chosen as the central processor under Rule 613.²⁹³

The Commission considered the views of the commenter that questioned the value of knowing whether a customer has a prior position in a security. The Commission also considered the commenter's concern about potential reporting complications for clients with multiple accounts, as well as general comments urging the Commission to reduce the burdens of

the Rule, and is adopting proposed Rule 613(j)(3) (renumbered as Rule 613(j)(7)) with modifications to delete certain data elements.

After considering the commenters' views, and re-evaluating the necessity of requiring certain specific data elements, the Commission has determined not to require the locate identifier (if a short sale); whether the order is solicited or unsolicited; and whether the account has a prior position in the security. The Commission believes the consolidated audit trail can still achieve significant benefits without requiring the routine recording and reporting of these specific data elements to the central repository.²⁹⁴ While this information may be useful for certain investigations and market analyses, the Commission believes that this additional data could be readily obtained from a follow-up request to a broker-dealer if the other data required by proposed Rule 613(j)(3), particularly relating to the customer behind the order, is included in the consolidated audit trail. Thus, the Commission believes that it is unnecessary to require this additional data to be reported as a standard part of the consolidated audit trail. In effect, the Commission believes that the benefits of having these specific audit trail data elements are minimal. As such, the Commission does not believe the benefits to the Commission and the public to consider the detailed costs and benefits of such data elements justify the costs to SROs for including them in their NMS plan submission.

In response to the commenter who recommended that the proposed Rule should capture the identity of the individual who originated the order (in addition to identifying the firm) and the system he or she used to originate the order,²⁹⁵ the Commission notes that Rule 613 defines "customer" as: "(i) The account holder(s) of the account at a registered broker-dealer originating the order; and (ii) any person from whom the broker-dealer is authorized to accept trading instructions for such account, if different from the account holder(s)." ²⁹⁶ The Rule does not require the identification of the individual registered representative who placed the order.²⁹⁷ Further, the Commission does not believe that "the system he or she used to originate the order" is of

significant enough regulatory value to require that information to be recorded and reported under Rule 613 at this time.

(A) Order Type

As proposed, the Rule would have required that members report the order type as an element of the material terms of an order. In the Proposing Release, the Commission explained that the proposed Rule does not specify the exact order types (e.g., market, limit, stop, pegged, stop limit) that could be reported under the Rule in recognition that order types may differ across markets and an order type with the same title may have a different meaning at different exchanges.²⁹⁸ The Commission also noted that markets are frequently creating new order types and eliminating existing order types. Thus, the Commission preliminarily believed that it would not be practical to include a list of order types in the proposed Rule as part of the required information to be reported to the central repository.

The Commission received one comment in response to its request for comment on its proposed approach to handling order types. This commenter believed that the Commission did not think that order types were needed for the consolidated audit trail, and argued that this information is "essential for any attempts to use the order data to reconstruct the state of the limit order book at any point in time."²⁹⁹ The Commission agrees that information about an order's type is important and notes that the Rule, as proposed, did require order types to be reported.³⁰⁰ Thus, the Commission is adopting the Rule, as proposed, to require plan sponsors to include in the NMS plan submitted to the Commission for its consideration a requirement for SROs and members to report the order type as an element of the material terms of an order. The Rule, however, does not provide an exhaustive list of order types, as the Commission continues to believe that it is not feasible to do so in its Rule, for the reasons stated in the Proposing Release.³⁰¹ Rather, the Commission believes the plan sponsors should be responsible for determining how to describe and categorize specific order types in the NMS plan or in the NMS plan's technical specifications, as there is more flexibility to amend such

242.201(c) and (d). See Rule 200(g)(2) under the Exchange Act, 17 CFR 242.200(g)(2).

²⁸⁹ See Kumaraguru Letter, p. 1.

²⁹⁰ *Id.*

²⁹¹ See Ameritrade Letter, p. 3.

²⁹² *Id.*

²⁹³ See FINRA Proposal Letter, Appendix A.

²⁹⁴ See Section II.A.2., *supra*.

²⁹⁵ See Kumaraguru Letter, p. 1.

²⁹⁶ See Rule 613(j)(3); see also Section III.B.1.d.iii.(C).(2), *infra* (discussing the definition of "customer" as applied to investment advisers).

²⁹⁷ See Section III.B.1.d.ii., *infra*, for a discussion of the proposed requirement to report the unique identifier of the registered representative receiving or originating an order.

²⁹⁸ See Proposing Release, *supra* note 4, at 32575.

²⁹⁹ See Angel Letter, p. 2-3.

³⁰⁰ Order type information is important because it reflects the intention of the person originating an order with regard to how an order should be handled, and also provides information regarding the potential impact of orders on the market.

³⁰¹ See Proposing Release, *supra* note 4, at 32575.

documents and the SROs would have the most familiarity with the variations among the order types on their markets. The Commission notes that specific order types may differ across markets, and even an order type with the same title may have a different meaning at different exchanges. Further, SROs regularly develop new order types to respond to changes in market structures and trading strategies, and any list of order types will likely need to be updated over time.

(B) Special Handling Instructions

The proposed Rule also would have required that any special handling instructions be reported as part of the material terms of an order.³⁰² The Commission specifically requested comment in the Proposing Release on whether the Rule should require, as part of the disclosure of special handling instructions, the disclosure of an individual algorithm that may be used by a member or customer to originate or execute an order, and, if so, how such an algorithm should be identified. The Commission received one comment noting the importance of requiring the special handling instructions to be included in the consolidated audit trail.³⁰³ This commenter believed that special handling instructions were important for reconstructing the limit order book.³⁰⁴ Regarding algorithms, commenters generally were not in favor of unique identifiers for algorithms.³⁰⁵ One commenter urged against requiring customer information at the level of “individual strategy, trading desk, or particular algorithm * * *.”³⁰⁶ Another commenter stated that the proposed rule should not require that unique customer identifiers be affixed to computer algorithms.³⁰⁷ This commenter pointed out that algorithms change daily, which would result in uncertainty about whether new identifiers are needed. Further, the commenter argued that firms would need to develop safeguards to ensure proprietary algorithms and trading strategies are not appropriated by competitors. This commenter suggested that, instead of requiring a unique customer identifier, the Commission could require that a “flag”

be appended to orders generated by an algorithm.

The Commission agrees with the commenter that supported the proposed requirement that special handling instructions be reported³⁰⁸ and is adopting this requirement as proposed.³⁰⁹ The Commission believes that such information will be useful to regulators in attempting to recreate an SRO’s limit order book for market reconstructions. When performing market reconstructions, it is important for regulators not only to have information regarding what orders were on the book, but the conditions or special instructions attached to those orders. Such information can be of key importance in determining the amount of accessible liquidity at any price point and whether or not certain orders were entitled to be executed at various price levels.

Additionally, the Commission considered the comments received regarding whether an individual algorithm should be reported and identified as part of an order’s special handling instructions, and has determined not to adopt that requirement in recognition that algorithms change frequently and therefore it may be difficult to determine when and if new algorithm identifiers are necessary. The Commission also considered one commenter’s concern regarding the proprietary nature of algorithms and the risk of competitors appropriating algorithms if they were required to be identified in the consolidated audit trail. However, the Commission notes that, because the disclosure of whether an order is a result of an algorithm that makes trading decisions based on a programmed investment strategy might be useful for the Commission and the SROs to sort or filter trade data to reconstruct market events or to better evaluate potentially manipulative behavior or intent, the SROs may want to consider whether it would be feasible to include a “flag” or other indicator that would reveal whether an order was the result of an algorithmic trading calculation. Such a flag would not identify the actual algorithm used, but could instead indicate whether the order was the result of an algorithmic trade. Appending such a “flag” or indicator may aid regulatory authorities in their efforts to make preliminary assessments about market activity and better allow the SROs and the Commission to monitor the usage of algorithms over time. The Commission

acknowledges that by not requiring that algorithms be recorded and reported to the central repository, the consolidated audit trail may not contain an audit trail data element that might prove useful to regulatory authorities. The Commission, however, believes that, should regulatory authorities need such information, regulators can submit a request for this information and obtain the information about whether the order was the result of an algorithm readily from the broker-dealer that handled the order.

ii. Unique National Securities Exchange, National Securities Association and Broker-Dealer Identifiers

The Commission proposed to require each member originating or receiving an order from a customer, and each national securities exchange, national securities association, and member that subsequently handles the order to report its own unique identifier to the central repository. Proposed Rule 613(c)(7)(i)(E) (renumbered as 613(c)(7)(i)(C)) would have provided that any member of an SRO, that originally receives from a customer or originates a principal order, shall collect and electronically report “the unique identifier of the broker-dealer receiving or originating the order.” Similarly, proposed Rule 613(c)(7)(ii)(D) provided that the SRO or any member of such SRO that routes an order shall collect and electronically report “the unique identifier of the broker-dealer or national securities exchange routing the order.” Proposed Rule 613(c)(7)(ii)(E) provided that the SRO or any member of such SRO routing an order shall collect and electronically report “the unique identifier of the broker-dealer or national securities exchange receiving the order.” Proposed Rule 613(c)(7)(iii)(D) provided that the SRO or any member of such SRO that receives an order shall collect and electronically report “the unique identifier of the broker-dealer or national securities exchange receiving the order.” Proposed Rule 613(c)(7)(iii)(E) provided that the SRO or any member of such SRO that receives an order shall collect and electronically report “the unique identifier of the broker-dealer or national securities exchange routing the order.” Proposed Rule 613(c)(7)(iv)(E) required, for a modification or a cancellation of an order, the identity of the person giving such instruction. Proposed Rule 613(c)(7)(v)(F) provided that the SRO or any member of such SRO that executes an order in whole or part report “the unique identifier of the broker-dealer or national securities

³⁰² See proposed Rule 613(j)(3).

³⁰³ See Angel Letter, p. 2–3.

³⁰⁴ *Id.*

³⁰⁵ See Managed Funds Association Letter, p. 2; SIFMA Letter, p. 11; SIFMA Drop Copy Letter, p. 2.

³⁰⁶ See Managed Funds Association Letter, p. 2.

³⁰⁷ See SIFMA Letter, p. 11. SIFMA subsequently submitted an alternative proposal that did not include a flag for algorithms, citing lack of clarity in the Commission’s definition of algorithmic order, and stating that the FIX standard lacks existing fields to flag such orders. *Id.* at 2.

³⁰⁸ See Angel Letter, p. 2–3.

³⁰⁹ See Rule 613(j)(7).

exchange executing the order.” Further, the Commission proposed to require a member receiving an order from a customer to report, if applicable, “the unique identifier of the branch office and the registered representative receiving or originating the order.”³¹⁰

Commenters generally supported the proposed use of unique identifiers for exchanges and broker-dealers.³¹¹ One commenter explained that cross-market surveillance efforts are unduly complicated if a single market participant has a different identifier for each market, and stated that the current market participant identifier (“MPID”) system needed to be updated.³¹² This commenter, however, questioned whether it was necessary for branch office and registered representative information to be included in the consolidated audit trail, stating that the information would increase the amount of data reported to the consolidated audit trail, but would be useful only in certain circumstances.³¹³ In another letter, the same commenter proposed to use Central Registration Depository (“CRD”) numbers to uniquely identify broker-dealers.³¹⁴ Under this system, the commenter suggested that SROs would be required to link the CRD numbers to unique MPIDs to create a cross-referenced database, so that data could be searched and retrieved at the firm level (by CRD number) or by the unique market center identifiers used by firms for each transaction on a specific market center.³¹⁵ For activity not occurring on a national securities exchange, the commenter proposed continued reporting with MPIDs currently used for OATS reporting.³¹⁶ Another commenter supported the use of MPIDs as unique identifiers for

broker-dealers, suggesting that the MPIDs of the firms originating each order should be added to the trade report, but stated that only FINRA and the Commission should be allowed to access this information.³¹⁷

After considering commenters’ views requesting additional flexibility with respect to the unique identifiers requirement for national securities exchanges, national securities associations, and members, the Commission has determined to adopt the Rule to require plan sponsors to include in the NMS plan submitted to the Commission for its consideration a requirement for such unique identifiers, substantially as proposed. The Commission, however, has made two technical changes to the Rule text from the proposal to: (1) Add a defined term, “CAT-Reporter-ID,” in adopted Rule 613(j)(2) to refer to these unique identifiers, and (2) expressly permit that a “code” be used that uniquely and consistently identifies the national securities exchange, national securities association, or member. Specifically, adopted Rule 613(j)(2) provides that “[t]he term CAT-Reporter-ID shall mean, with respect to each national securities exchange, national securities association, and member of a national securities exchange or national securities association, a code that uniquely and consistently identifies such person for purposes of providing data to the central repository.”

In response to the commenters that stated that firms’ current MPIDs or CRD numbers may work as a viable unique broker-dealer identifier, the Commission believes it is appropriate to leave the decision of whether to specify an existing identifier, such as a firm’s MPID or CRD number, or some other identifier such as one created under the unique legal entity identifier (LEI) standard under development by the International Standards Organization (“ISO”) (ISO 17442),³¹⁸ as the unique broker-dealer identifier, to the plan sponsors to assess and propose in the NMS plan. Therefore, while the adopted Rule continues to require the NMS plan to require these unique identifiers, the Rule does not specify which identifier to use, nor does the Rule specify the process for assigning unique broker-

dealer identifiers.³¹⁹ In this regard, the Commission expects the plan sponsors to establish a process, to be described in the NMS plan, by which every national securities exchange, and every member of a national securities exchange or national securities association, can obtain a CAT-Reporter-ID.

The Commission also is adopting, substantially as proposed, rules requiring the NMS plan submitted to the Commission for its consideration to require each SRO and its members to report the unique identifier of the broker-dealer or SRO for each reportable event in the life of an order to the central repository, except to make two technical changes: to include the new defined term, “CAT-Reporter-ID” and to require the CAT-Reporter-ID or Customer-ID, if applicable, of the person giving a cancellation or modification instruction.³²⁰ Specifically, Rule 613(c)(7)(i)(C), as adopted, provides that any member of an SRO that originally receives from a customer or originates a principal order shall record and report “[t]he CAT-Reporter-ID of the broker-dealer receiving or originating the order.” Rule 613(c)(7)(ii)(D) provides that any national securities exchange or

³¹⁹ One commenter requested the Commission consider how the Department of the Treasury’s newly-created Office of Financial Research (“OFR”) would impact reporting requirements imposed by the consolidated audit trail. See SIFMA Letter, p. 22–23. The commenter noted that the collection powers granted to the OFR, as well as its authority to require standardized reporting of data, could affect how data is submitted to the consolidated audit trail. *Id.* at p. 22. The commenter suggested that any information that is provided to the consolidated audit trail should not be required to be provided to the OFR again or in a different format. *Id.* The Commission understands that the OFR has been participating in and encouraging efforts by interested parties to have a standard for assigning unique entity identifiers created by an internationally recognized standards body (“IRSB”) and that the ISO has issued a draft ISO standard, ISO 17442, for the financial services industry that is proposed to provide a viable global solution for the accurate and unambiguous identification of legal entities engaged in financial transactions. See ISO Press Release “ISO Financial Services Standard Wins Industry Support Six Months Ahead of Publication,” July 25, 2011. Because the ISO standard is still in draft form and issues of implementation, governance and operating procedures remain to be resolved, the Commission does not believe that it is appropriate for it to mandate the use of the ISO standard at this time. The Commission notes, however, that to the extent that unique entity identifiers become available from an IRSB, Rule 613 provides SROs with sufficient flexibility to submit, if they so chose, an NMS plan that makes use of those identifiers and requires all or some reporting parties to obtain such identifiers, assuming such identifiers otherwise meet the requirements of the Rule.

³²⁰ See proposed Rule 613(c)(7)(iv)(E) (requiring the reporting of the identity of the person giving a modification or cancellation instruction for an order); adopted Rule 613(c)(7)(iv)(F) (requiring the CAT-Reporter-ID or Customer-ID of such person instead).

³¹⁰ See Proposed Rule 613(c)(7)(i)(F).

³¹¹ See SIFMA Letter, p. 12; Liquidnet Letter, p. 6; FINRA Letter, p. 4; FINRA Proposal Letter, p. 6.

³¹² See FINRA Letter, p. 4 (explaining that “multiple firms can currently be represented by a single MPID that is used for market access arrangements and is assigned to another firm that has no direct relationship to the trading activity being reported under that MPID”). This commenter also supported the use of more specific “sub-identifiers” to allow regulators to distinguish between desks or trading units within a firm.

³¹³ *Id.* at p. 9. FINRA also requested that the Commission reconsider the need for reporting the identification of the beneficial owner, the identification of the person exercising investment discretion, and the unique identifier of the branch office and registered representative. For further discussion of this comment, see note 170 *supra* and accompanying text.

³¹⁴ See FINRA Proposal Letter, p. 6, 13. The CRD is the central licensing and registration system operated by FINRA which contains employment, qualification and disciplinary histories for securities industry professionals who do business with the public.

³¹⁵ See FINRA Proposal Letter, p. 6, 13.

³¹⁶ *Id.* at p. 6.

³¹⁷ See Angel Letter, p. 2.

³¹⁸ This standard is being developed by Technical Committee 68 (TC68) of ISO, in whose meetings a Commission staff representative participates. Its final publication is subject to the resolution of specific issues on implementation, operating procedures, and the need to coordinate with a global legal entity identifier initiative conducted by the global regulatory community, in which a Commission staff representative is also participating.

any member of an SRO that routes an order shall record and report “[t]he CAT-Reporter-ID of the broker-dealer or national securities exchange routing the order.” Rule 613(c)(7)(ii)(E) provides that any national securities exchange or member of an SRO that routes an order shall record and report “[t]he CAT-Reporter-ID of the broker-dealer, national securities exchange, or national securities association to which the order is being routed.” Rule 613(c)(7)(iii)(D) provides that the SRO or any member of an SRO that receives a routed order shall record and report “[t]he CAT-Reporter-ID of the broker-dealer, national securities exchange, or national securities association receiving the order.” Rule 613(c)(7)(iii)(E) provides that the SRO or any member of an SRO that receives a routed order shall record and report “[t]he CAT-Reporter-ID of the broker-dealer or national securities exchange routing the order.” Rule 613(c)(7)(iv)(F) provides that the SRO or any member of an SRO that receives an instruction to modify or cancel an order shall record and report “[t]he CAT-Reporter-ID of the broker-dealer or Customer-ID of the person giving the modification or cancellation instruction.” Rule 613(c)(7)(v)(F) provides that the national securities exchange or any member of an SRO that executes an order in whole or part shall record and report “[t]he CAT-Reporter-ID of the broker-dealer or national securities exchange executing the order.” Rule 613(c)(7)(vi)(B) provides that, if an order is executed in whole or part, a member of an SRO shall record and report “[t]he CAT-Reporter-ID of the clearing broker or prime broker, if applicable.”

The Commission notes that CAT-Reporter-IDs will be reported to the central repository for each reportable event that the member or SRO is reporting to the central repository. The requirement to report CAT-Reporter-IDs in this manner will help ensure that regulators can determine which market participant took action with respect to an order at each reportable event. The Commission does not believe that the CAT-Reporter-ID of each member or market that touches an order needs to be tagged to and travel with an order for the life of the order, as long as the CAT-Reporter-ID of the member or exchange taking the action is reported to the central repository, and an order identifier(s) is reported at every reportable event of the order. The Commission believes the details of how these data are reported to the central repository, and the specific methodologies used by the central

repository to assemble time-sequenced records of the full life-cycle of an order, is best left to the expertise of the SROs as they develop the NMS plan to be submitted to the Commission for its consideration. Instead, as adopted, Rule 613 requires that data in the central repository be made available to regulators in a linked fashion so that each order can be tracked from origination through modification, cancellation, or execution, and that the parties routing or receiving routes, or otherwise performing such actions, are identified for every reportable event.

After considering the comment opposing the requirement to report to the central repository the unique identifier of the branch office and registered representative receiving or originating an order,³²¹ the Commission has reconsidered the requirement in proposed Rule 613(c)(7)(i)(F) and is not adopting this requirement.³²² While this audit trail data may be useful in the context of certain investigations or market analyses, upon further consideration, the Commission believes that this information need not be required by Rule 613 because it is not critical information to help identify the customer responsible for trading a security, nor to capturing the entire life of an order as it moves from origination to execution or cancellation. In addition, the Commission believes that a requirement that a unique identifier of the branch office and registered representative receiving or originating the order be reported may not provide enough information in an initial assessment of whether illegal or manipulative activity is occurring in the marketplace to warrant that this information be required in the audit trail created by Rule 613. Further, should regulators determine that the identity of the branch office and registered representative receiving or originating the order is needed to follow-up on a specific issue, they may request the information directly from the broker-dealer as broker-dealers are required to make and keep records identifying the registered representative that receives an order pursuant to Exchange Act Rules 17a-3(a)(6)(i)³²³ and 17a-4(b)(1).³²⁴ As such, the Commission does not believe the benefits of including this information in the consolidated audit trail justify the costs to SROs for requiring them to devise a methodology to identify the branch offices and registered

representatives receiving or originating an order, and a mechanism for reporting this type of data to the central repository.

iii. Unique Customer Identifier

(A) Proposed Rule

As proposed, Rule 613 would have required every SRO and broker-dealer to report a unique customer identifier to the central repository for any order originated by or received from such customer.³²⁵ Specifically, proposed Rule 613(c)(7)(i)(B) (renumbered as Rule 613(c)(7)(i)(A)) would have required that a national securities exchange, national securities association or any member of such exchange or association that originally receives or originates an order to collect and electronically report “a unique customer identifier for each customer.” In the Proposing Release, the Commission noted that the unique customer identifier should remain constant for each customer, and have the same format, across all broker-dealers.³²⁶

The Commission requested comment on possible ways to develop and implement unique customer identifiers. For example, the Commission solicited input about who should be responsible for generating the identifier; whether a unique customer identifier, together with the other information with respect to the customer that would be required to be provided under the proposed Rule, would be sufficient to identify individual customers; and whether there were any concerns about how the customer information would be protected. The Commission specifically requested comment on what steps should be taken to ensure that appropriate safeguards are implemented with respect to the submission of customer information, as well as the receipt, consolidation, and maintenance of such information in the central repository.

(B) Comments on Proposed Rule 613(c)(7)(i)(B)

The Commission received comments that supported the general notion that identifying customers in an audit trail would be beneficial for regulatory purposes.³²⁷ One commenter stated that a customer identifier on an order-by-order basis would “enhance significantly the audit trails of the

³²⁵ See Rule 613(j)(3) for a definition of “customer.”

³²⁶ See Proposing Release, *supra* note 4, at 32573; proposed Rule 613(c)(7)(i)(B).

³²⁷ See CBOE Letter, p. 2; Managed Funds Association Letter, p. 2; FINRA Letter, p. 9; SIFMA Drop Copy Letter, p. 1; SIFMA Letter, p. 9.

³²¹ See note 313, *supra*.

³²² See proposed Rule 613(c)(7)(i)(F).

³²³ 17 CFR 240.17a-3(a)(6)(i).

³²⁴ 17 CFR 240.17a-4(b)(1).

markets.”³²⁸ Similarly, another commenter agreed that identifying the customer would be useful to regulators for purposes of market surveillance and enforcement.³²⁹ Another commenter noted that it “fully supports more granularity in an order audit trail, such as obtaining high-level customer identity information (e.g., large trader identification), so that patterns of trading across multiple market centers can be quickly and readily identified, and [the commenter] agrees that the timeframe needed to identify customers should be greatly reduced; however, [the commenter] question[s] the utility of receiving the identity of both the beneficial owner and the person exercising the investment discretion, if different, for each and every order reported to the consolidated audit trail.”³³⁰

However, other commenters disagreed with the need for a unique customer identifier and the proposed Rule’s requirements for reporting a unique customer identifier with every order. These commenters generally focused on the complexity and cost of the systems changes required to implement the unique customer identifier requirement for every customer;³³¹ the complexity in the process for assigning unique customer identifiers;³³² the alternative ways that a customer could be identified without requiring a unique customer identifier as proposed;³³³ and the concerns about how the privacy of customers might be compromised if every customer was assigned a unique customer identifier.³³⁴

One commenter discussed the complexity and cost of the systems changes required to implement the unique customer identifier requirement, as set forth in the Rule.³³⁵ This commenter, who did not believe the Commission should require a unique customer identifier for every customer, noted the “complexity of the technology development work involved” in adding this identifier to the audit trail.³³⁶ The commenter added that the work

required to update internal architecture to report customer identifiers would be “substantial” because broker-dealer systems and processes may access and maintain customer (and proprietary) identification information in different ways and at different levels of specificity, and that sales and trading systems would need to be modified to report the unique customer identifiers with every order. This commenter also noted the “significant costs” generally associated with requiring a unique customer identifier.³³⁷

A few commenters also submitted their views on the complexity of the process for assigning unique customer identifiers.³³⁸ One commenter noted that the process for assigning unique customer identifiers that the Commission discussed in the Proposing Release (*i.e.*, generating unique customer identifiers based on the input by a broker-dealer of a customer’s social security number or tax identification number) would not create an administrative burden on individuals and non-broker-dealer entities.³³⁹ Another commenter, however, noted difficulties associated with implementing a centralized process for assigning, storing and utilizing standardized customer identifiers³⁴⁰ and another commenter characterized the “implementation of a centralized customer identification system” as a “monumental task.”³⁴¹ Another commenter believed that to satisfy the Rule’s requirements, the industry would need to implement a completely new market-wide system to satisfy the unique customer identifier requirement, noting that this might not be feasible on the proposed timeline.³⁴² Another commenter characterized the collection of a unique customer identifier as a “significant project unto itself.”³⁴³ One commenter observed that given the large number of retail investors (some with multiple accounts), the complexities associated with tracking retail investors’ accounts, and the relatively small and infrequent amount of trading by typical retail investors, the Rule should not require unique customer identifiers for every customer.³⁴⁴ Another commenter

urged the Commission to specify whether the process required that a unique customer identifier be submitted at the time an order is originated or received and the procedure to be followed if an identifier is not available.³⁴⁵

A few commenters suggested alternative ways to identify a customer, rather than through a unique customer identifier.³⁴⁶ One commenter suggested that customers could be identified by amending the current trade report.³⁴⁷ Another commenter believed that “sophisticated analysis could identify trading activity that *might* be coordinated, without using an account identifier, and that regulators could then perform further analysis to determine who traded by using [EBS] and other methods already available to the staff.”³⁴⁸ Another commenter noted that a possible method for identifying customers could be by linking customer information in EBS to trading information in OATS.³⁴⁹ Another commenter noted that “[i]t makes economical sense to use the current OATS and COATS audit trails and to expand those audit trails to include additional customer information, thereby providing a more complete audit trail for regulatory oversight for post trade analysis rather than building another audit trail system.”³⁵⁰

Commenters also discussed the need for both a large trader identification number under Rule 13h-1 under the Exchange Act, the Commission’s Rule implementing the large trader reporting system,³⁵¹ and a unique customer identifier under Rule 613.³⁵² One commenter stated that the Commission could alleviate some of the burdens of the proposed Rule, and increase the effectiveness of an identification system, if it required only large trader identification numbers to be reported instead of requiring a unique customer identifier for every customer.³⁵³ This commenter believed that the Commission and the SROs are unlikely

³²⁸ See CBOE Letter, p. 2.

³²⁹ See Managed Funds Association Letter, p. 2.

³³⁰ See FINRA Letter, p. 9.

³³¹ See SIFMA Drop Copy Letter, p. 1. See also SIFMA Letter, p. 9.

³³² See Liquidnet Letter, p. 4; SIFMA Letter, p. 10–11; Knight Letter, p. 2; Scottrade Letter, p. 1; Direct Edge Letter, p. 3; FINRA Proposal Letter, p. 4.

³³³ See Angel Letter, p. 2; FIF Letter, p. 2; BOX Letter, 2.

³³⁴ See SIFMA Letter, p. 10; Wells Fargo Letter, p. 3; Ross Letter, p. 1; ICI Letter, p. 3; FIF Letter, p. 2.

³³⁵ See SIFMA Drop Copy Letter, p. 1. See also SIFMA Letter, p. 9.

³³⁶ *Id.*

³³⁷ See SIFMA Letter, p. 9, 10.

³³⁸ See Liquidnet Letter, p. 4; SIFMA Letter, p. 10–11; Knight Letter, p. 2; Scottrade Letter, p. 1; Direct Edge Letter, p. 3; FINRA Proposal Letter, p. 4; SIFMA Letter, p. 11.

³³⁹ See Proposing Release, *supra* note 4, at 32573; Liquidnet Letter, p. 4.

³⁴⁰ See SIFMA Letter, p. 10.

³⁴¹ See Knight Letter, p. 2.

³⁴² See Scottrade Letter, p. 1. See also Knight

Letter, p. 2; Direct Edge Letter, p. 4.

³⁴³ See Direct Edge Letter, p. 3.

³⁴⁴ See FINRA Proposal Letter, p. 4.

³⁴⁵ See SIFMA Letter, p. 11.

³⁴⁶ See Angel Letter, p. 2; FIF Letter, p. 2; BOX Letter, p. 2.

³⁴⁷ See Angel Letter, p. 2. This commenter stated that “[i]t would be relatively simple and cheap to add four fields to each trade report that would contain the account numbers of the buyer and seller and the Market Participant Identifier (MPID) for the original order entry firms.”

³⁴⁸ See FIF Letter, p. 2. This commenter recommended that the requirement for such unique customer identifiers be tabled until after regulators have experience using CAT without this identifier.

³⁴⁹ See FIF Letter, p. 2.

³⁵⁰ See BOX Letter, p. 2.

³⁵¹ See Section II.A.3., *supra*.

³⁵² See SIFMA Letter, p. 11; FINRA Proposal Letter, p. 6–7.

³⁵³ See SIFMA Letter, p. 11.

to be interested in routine transactions by small investors and would much more likely need accurate information about the orders of large traders because they are most likely to engage in transactions large enough to impact prices.³⁵⁴ Another commenter noted that an alternative would be to only identify entities that have sponsored or direct access to market centers via a relationship with a sponsoring market participant and to identify customers whose trading activity would be required to be disclosed pursuant to Rule 13h-1.³⁵⁵

Certain commenters discussed concerns about how the privacy of customers might be compromised if every customer was assigned a unique customer identifier.³⁵⁶ One commenter, noting the Commission's discussion in the Proposing Release that the unique customer identifiers could be based on a customer's social security number or taxpayer identification number, believed that the Commission's approach raises "serious privacy concerns."³⁵⁷ Another commenter noted that "there is a legitimate privacy concern with having the unique customer identifier available to the marketplace, and creating a means to protect that privacy would add tremendous incremental cost to the [consolidated audit trail]."³⁵⁸ One

³⁵⁴ *Id.* See also FINRA Proposal Letter, Appendix B (setting forth a method for identifying large traders through the "registration of unique market participant identifiers rather than by requiring broker-dealers to provide the CAT processor with any large trader numbers assigned by the SEC in order reports, thereby minimizing the ability of market participants to reverse engineer a large trader's identity or trading strategy").

³⁵⁵ See FINRA Proposal Letter, p. 6-7.

³⁵⁶ See SIFMA Letter, p. 10; Wells Fargo Letter, p. 3; Ross Letter, p. 1; ICI Letter, p. 2; FIF Letter, p. 2.

³⁵⁷ See SIFMA Letter, p. 10 (noting that "in recent years, increased concerns about identity theft and client confidentiality have led the securities industry to move away from using social security identification numbers or taxpayer identification numbers as a way to monitor clients and customers. The SEC has affirmed that it would guard access to customer social security and taxpayer identification numbers with even more safeguards than it does other information in the central repository of the consolidated audit trail. Although the SEC has a strong record of protecting investor privacy, the very presence of potentially billions of unique customer identifiers tied to personal information in a central repository would create a substantial risk of misuse and identity theft. The risk of unique customer identifiers being stolen or misused would be magnified in a real-time reporting system").

³⁵⁸ See Wells Fargo Letter, p. 3. However, this commenter also noted that, "[w]hile the full panoply of privacy concerns that flow from having a unique order identifier being available to every participant in the order execution process may be difficult to assess, creating a system that has that unique identifier available for primarily the post trade review likely solves both the privacy and cost issues in a manner reasonable for both clients, market participants and regulators." *Id.*

commenter questioned how long and at what level customer information would be encrypted,³⁵⁹ and another noted that "[t]he proposal needs to clarify who will have access to customer data and how confidentiality will be ensured."³⁶⁰

(C) Adopted Rule

(1) Need for a Unique Customer Identifier

The Commission recognizes that the implementation of the unique customer identifier requirement may be complex and costly, and the reporting of a unique customer identifier will require SROs and their members to modify their systems to comply with the Rule's requirements. The Commission, however, believes that unique customer identifiers are vital to the effectiveness of the consolidated audit trail. The inclusion of unique customer identifiers should greatly facilitate the identification of the orders and actions attributable to particular customers and thus substantially enhance the efficiency and effectiveness of the regulatory oversight provided by the SROs and the Commission. Without the inclusion of unique customer identifiers, many of the benefits of a consolidated audit trail as described above in Section II.2. would not be achievable.

For example, unique customer identifiers will make regulatory inquiries and investigations more efficient by eliminating delays resulting from the current need to send information requests to individual market participants in search of this key information, as well as reducing the burden on regulators and market participants of such requests.³⁶¹ The

³⁵⁹ See Ross Letter, p. 1 (asking at what level of security to encrypt customer data, and for how long to encrypt it for, as well as how long the Commission would need to decrypt the customer's name—whether on a real time or overnight basis, and noting that data encryption is expensive and could enlarge message sizes.) See also ICI, p. 3 (suggesting that the Commission expressly state who would have access, when they could access it, and how they could use it; and also recommending requiring that all data sent to the central repository be encrypted and that certain fields be "masked" or that reporting of information in such fields be delayed until end-of-day to reduce concerns about leaked information being used for frontrunning).

³⁶⁰ See FIF Letter, p. 2.

³⁶¹ Because existing SRO audit trails do not require customer information to be reported, regulators must request that information identifying the customer, often from a multitude of sources, which can result in significant delays in investigating market anomalies or violative trading. Additionally, indirect access to an exchange (such as "sponsored access" arrangements) also has made it more difficult to use the current EBS system and Rule 17a-25 to identify the originating customer because the broker-dealer through whom an order is sent to an exchange may not know or have direct

identity of the customer is often necessary to tie together potential manipulative activities that occur across markets and through multiple accounts at various broker-dealers. Existing audit trails, however, do not identify the customer originating the order and thus do not allow SRO and Commission regulatory staff to quickly and reliably track a person's trading activity wherever it occurs in the U.S. securities markets. A unique customer identifier connected to each order will allow the SROs and the Commission to more quickly identify the customer that originated each order and therefore potentially more quickly and efficiently stop manipulative behavior through the submission of orders. In certain cases this might limit the losses of parties injured by malfeasance who currently may suffer losses during the weeks or months that it can currently take for regulators to obtain customer information through written requests for information.

Further, unique customer identifiers will aid regulators in reconstructing broad-based market events. Specifically, having unique customer identifiers will aid regulators in determining how certain market participants behaved in response to market conditions and may even reveal the identity of the market participant(s) who caused or exacerbated a broad-based market event. More so, unique customer identifiers would enable regulators to disaggregate the market activity of different participants in ways that could help address many important questions related to equity and equity options market structure, ranging from more detailed analyses of the potential impacts of high frequency trading, to studies of market liquidity, to trend analyses of the trading costs and general efficiency by which investors use our public markets to acquire or dispose of their securities holdings.

The Commission has considered commenters' concerns about the complexity of the process for creating and assigning unique customer identifiers and understands and acknowledges that the process of creating and assigning unique customer identifiers may not be simple and may result in additional costs to SROs and their members.³⁶² The Commission also considered the commenters' views that there may be alternative ways to identify the customer responsible for orders, and that, in the view of some

access to information identifying the customer who originally submitted the order.

³⁶² See notes 331-334, *supra*, and accompanying text.

commenters, every individual customer need not be identified for purposes of an audit trail. As noted above, the Commission believes that the identification of each customer responsible for every order is critical to the effectiveness of a consolidated audit trail and does not agree that the commenters' alternative means of identifying a customer would be as effective as the method proposed by Rule 613. For example, the Commission considered the comment that customers could be identified by amending the trade report, but this approach would fail to identify customers associated with orders that are not executed.³⁶³ Additionally, account numbers are assigned by broker-dealers for their own customers only, and account numbers vary between broker-dealers. Thus, the identity of a customer from a specific account number would not be apparent to regulators without the time-consuming requests for information Rule 613 specifically is seeking to avoid. The use of unique customer identifiers would permit regulators to readily trace market activity by the same customer back to that unique customer identifier even if such market activity were affected across multiple accounts and broker-dealers.

The Commission also considered the recommendations of some commenters that the consolidated audit trail should use the large trader identifier instead of a unique customer identifier.³⁶⁴ The Commission, however, does not believe that the commenters' approach will address the regulatory need to obtain information on and to identify the holders of accounts for all order activity in the market for NMS securities because the use of the large trader identifier alone would identify only those traders that self-report as "large traders" pursuant to Rule 13h-1 and are assigned a large trader unique identifier. Thus, under the commenters' suggested approach, only a very small portion of customers—the very largest traders in the market—would be assigned a unique identifier for purposes of the consolidated audit trail. Smaller traders, however, also can be perpetrators of illegal activity, or otherwise impact the market. Accordingly, the Commission believes that information on all customers is necessary to achieve the goal of Rule 613.

Despite the wide and disparate array of views from commenters on the costs, complexities, and most efficient methodologies to generate and collect

unique customer identifiers, the Commission believes that the potential benefits of including this information in the consolidated audit trail justify the costs to the SROs in requiring that they develop and include a detailed framework for unique customer identification as part of the NMS plan to be submitted for consideration by the Commission and the public. Therefore, the Commission is adopting the Rule substantially as proposed to provide that the NMS plan must require every member to report a unique customer identifier to the central repository upon origination or receipt of an order as required by Rule 613(c)(7)(i)(A). The Commission, however, is changing the term "unique customer identifier," as used in the proposed Rule, to the term "Customer-ID." Adopted Rule 613(j)(5) defines the term "Customer-ID" to mean, "with respect to a customer, a code that uniquely and consistently identifies such customer for purposes of providing data to the central repository."³⁶⁵

Given the complexity and the various existing options for identifying a customer, the Commission believes that the plan sponsors, by engaging in a detailed process that combines their own expertise with that of other market participants, are in the best position to devise a methodology for, and estimate the costs of, including customer identifiers in the consolidated audit trail. Once the NMS plan was submitted, the Commission and the public would then be able to consider the details and costs of such a framework.

The Commission notes that the Rule does not specify the process for assigning the unique customer identifiers, or the format for such identifiers; rather, the Rule contemplates that the plan sponsors have the flexibility to determine the precise way to assign or "code" these identifiers. In this regard, the Commission expects the plan sponsors to establish a process by which every broker-dealer can, in a cost-effective manner, obtain a unique customer identifier, or Customer-ID, for each of their customer(s).³⁶⁶ The Commission also expects the plan sponsors to

establish a process by which unique customer identifiers are reported to the central repository, and how this information is linked to the name and address of customers as stored in the central repository. The Commission further notes that Rule 613 does not specify that unique customer identifiers must be attached to every reportable event as orders are routed from one market or broker-dealer to another, or that these identifiers are reported at the same time and fashion as other customer-identifying information. Rather, the Commission is relying on the SROs, and other market participants,³⁶⁷ to develop a proposal that maximizes efficiency and security, and that data in the central repository be made available to regulators in a linked fashion so that each order, and all subsequent reportable events, can be readily traced back to one or more customers through their unique identifiers.

In response to the commenter that questioned what should happen if a unique customer identifier was not available,³⁶⁸ the Commission notes that the Rule does not set out a process for addressing a situation where a unique customer identifier is not available to a broker-dealer and/or customer. Instead, the Commission believes that the plan sponsors are in the best position to address this situation as they develop the overall process for assigning unique customer identifiers. In response to the comment that requested the Commission specify whether a unique customer identifier is required to be reported at the time an order is originated or received,³⁶⁹ the Commission notes that Rule 613(c)(7)(i)(A) requires that the NMS plan require that this information be recorded contemporaneously with the reportable event, but permits the reporting of the identifier by 8:00 a.m. Eastern Time on the trading day following the day such information has been recorded.³⁷⁰ In addition, in response to the commenter that believed that the consolidated audit trail should identify market participants with direct or sponsored access to markets,³⁷¹ the Commission notes that under the Rule, to assure the Commission and the SROs of an accurate and complete audit trail for every action that every market participant takes with respect to an order, the sponsored party will be assigned a Customer-ID and the

³⁶⁵ For purposes of the following discussion, the Commission will use the terms "unique customer identifier" and "Customer-ID" interchangeably.

³⁶⁶ Under the Rule, each customer would be assigned a unique customer identifier, or Customer-ID. However, an order may have more than one Customer-ID if the account holder differs from the person from whom the broker-dealer is authorized to take trading instructions or if more than one person is an account holder for the account or is authorized to give trading instructions for the account.

³⁶⁷ See Rule 613(a)(1)(xi).

³⁶⁸ See SIFMA Letter, p. 11.

³⁶⁹ See SIFMA Letter, p. 11.

³⁷⁰ See Section III.B.1.e., *infra*.

³⁷¹ See FINRA Letter, p. 8–9.

³⁶³ See Angel Letter, p. 2.

³⁶⁴ See SIFMA Letter, p. 9–11; FINRA Proposal Letter, p. 4 and 6.

sponsoring broker-dealer will be assigned a CAT-Reporter ID under Rule 613.

The Commission also considered the privacy and security concerns that commenters raised with respect to the use of Customer-IDs.³⁷² In response to these comments, the Commission is revising proposed Rule 613, as discussed in more detail in Section III.B.2.e. below, to include additional mechanisms to safeguard the privacy and confidentiality of the audit trail data, including the Customer-ID, in large part to address the privacy concerns raised by commenters.³⁷³ In response to the commenter that questioned when and at what level customer information would be encrypted,³⁷⁴ the Commission notes that, while Rule 613 does not explicitly require that this information be encrypted, the Rule contains several safeguards to ensure the privacy and confidentiality of the audit trail data. Specifically, adopted Rule 613(e)(4) requires the NMS plan to include policies and procedures, including standards, to be used by the plan processor to ensure the security and confidentiality of all information reported to the central repository. In addition, one of the considerations the NMS plan must address is how the security and confidentiality of all information, including customer information, reported to the central repository, will be ensured.³⁷⁵ Based on these provisions, the Commission believes that plan sponsors would need to make sure customer information is protected, and the plan sponsors could require such data to be encrypted.

Additionally, the Commission believes that privacy concerns also could be mitigated if the plan sponsors determine, as permitted by Rule 613, that the unique customer identifiers not travel with the order, and instead be reported to the central repository only upon the receipt or origination of an order. Therefore, if the plan sponsors make this decision, the SROs and their members will not be able to use the unique customer identifier to track the identity of a customer(s) or a customer's order flow.³⁷⁶ While the unique customer identifier will be linked to information that is sufficient to identify a customer (*e.g.*, the name and address

of the customer) and customer account information³⁷⁷ at the central repository, this information will be accessible only by regulators for regulatory purposes.³⁷⁸ The Commission also notes that the plan sponsors could determine not to require that a customer's social security number or tax identification number be used as a customer's unique identifier to the extent they believe that there are privacy and confidentiality concerns.

(2) Definition of "Customer"

As proposed, Rule 613(j)(1) (renumbered as Rule 613(j)(3)) defined "customer" as "[t]he beneficial owner(s) of the account originating the order; and [t]he person exercising investment discretion for the account originating the order, if different from the beneficial owner(s)." The Commission received two comments regarding the inclusion of beneficial owners in the definition of customer. One commenter questioned the use of a unique customer identifier for both a beneficial owner of an account and the person exercising investment discretion, if different, and noted that if a trade comes into question, the person exercising investment discretion, not the beneficial owner, likely will be the "first person of interest in any type of review or investigation of such trading activity."³⁷⁹ Another commenter requested further clarity regarding the definition of "customer" for purposes of Rule 613, and suggested that the Commission should define "beneficial owner" to be sure this term is applied correctly.³⁸⁰ This commenter specifically stated that "[t]he SEC should also provide a definition for the terms 'beneficial owner' and 'customer' to eliminate any doubts as to whom these labels apply. For example, is the 'customer' the entity directing the trade or the beneficial owner of the account?" and added that, "for registered investment advisers, the unique customer identifier should be associated with the investment adviser rather than the underlying beneficial owner. Frequently, investment advisers aggregate orders for multiple beneficial owners in 'bulk' orders that are routed together and allocated on an average-priced basis to ensure best execution."³⁸¹

In response to commenters' concerns about the use of the term "beneficial owner," the Commission is revising

Rule 613(j)(1), as proposed (renumbered as Rule 613(j)(3)), to state that "[t]he term 'customer' shall mean: (i) [t]he account holder(s) of the account at a registered broker-dealer originating the order; and (ii) [a]ny person from whom the broker-dealer is authorized to accept trading instructions for such account, if different from the account holder(s)." The Commission believes that the revised Rule will provide it with the customer information required to achieve the objectives of the consolidated audit trail.³⁸²

In adopting this revised definition, the Commission is clarifying its intent that, with respect to the "account holder" reference under Rule 613(j)(3), the NMS plan submitted to the Commission for its consideration must require broker-dealers to capture information on only the individuals or entities that currently are required to be recorded in the books and records of the broker-dealer pursuant to Rule 17a-3(a)(9) under the Exchange Act.³⁸³ Because this provision does not require broker-dealers to obtain information about their account holders beyond what they are required to obtain today, the Commission believes the modification to the proposed Rule is appropriate because it will reduce the proposed Rule's burden on broker-dealers in recording and reporting information about a "customer," as that term will be defined under Rule 613(j)(3). The Commission notes that, under the Rule, as adopted, for joint accounts—where two individuals are required to provide information under Rule 17a-3 of the Exchange Act for one account—information for both persons listed on the joint account would be recorded and reported under Rule 613.³⁸⁴

The Commission also believes that it is important to capture the person that has authority to give trading instructions to a broker-dealer for an account, if different from the account holder, because such person likely will be of interest in a review or investigation of activity in such account.

³⁸² The Commission also notes that it retains the authority to request additional information from broker-dealers (and other market participants it regulates) where information about a customer of a broker-dealer beyond that required by Rule 613(j)(3) is needed to fulfill its mission.

³⁸³ Rule 17a-3(a)(9), among other things, requires a broker-dealer to make and keep a record of the name and address of the "beneficial owner" of each cash or margin account with the broker-dealer. 17 CFR 240.17a-3(a)(9). Rule 613 is not intended to alter in any way the information that a broker-dealer is currently required to obtain under Rule 17a-3(a)(9).

³⁸⁴ The Commission notes that, under Rule 613, both joint account holders would also receive their own unique customer identifier.

³⁷² See ICI Letter, p. 2-4; SIFMA Letter, p. 10-11; Angel Letter, p. 2; Ross Letter, p. 1.

³⁷³ See Section III.B.2.e., *infra*.

³⁷⁴ See Ross Letter, p. 1.

³⁷⁵ See Rule 613(a)(1)(iv).

³⁷⁶ See also Section III.B.2.e., *infra*, for a discussion of the provisions in the NMS plan designed to protect the privacy and confidentiality of the consolidated audit trail data.

³⁷⁷ See Rule 613(j)(4).

³⁷⁸ See Rule 613(e)(2). See also Section III.B.2.d., *infra*.

³⁷⁹ See FINRA Letter, p. 9.

³⁸⁰ See SIFMA Letter, p. 11.

³⁸¹ *Id.*

Thus, the Commission is modifying the proposed Rule to clarify its intent that under Rule 613 the NMS plan also must capture, in the definition of customer, “[a]ny person from whom the broker-dealer is authorized to accept trading instructions, if different from the account holder(s).”³⁸⁵ Knowing the identity of the person who is authorized to give the broker-dealer trading instructions for an account, whether the account holder or an adviser or other third party, is a vital component in the investigative process. Further, when investigating violations of the federal securities laws, it is important to promptly identify all potentially relevant parties who may have made trading or investment decisions, which could include both the person authorized to give the broker-dealer trading instructions for such account and the account holder.³⁸⁶

Pursuant to the revised definition of “customer” under adopted Rule 613, for example, if an order is entered to buy or sell securities for the account of an investment company or other pooled investment vehicle (a “fund”), the Rule will capture, in the definition of customer, the fund itself or, if the account at the broker-dealer is held only in the name of the fund’s investment adviser from whom the broker-dealer is authorized to accept trading instructions, the Rule will capture the investment adviser.³⁸⁷ If the account at the broker-dealer is held in the name of the fund itself, the Rule will capture both the name of the fund (pursuant to Rule 613(j)(3)(i)), as well as the name of the fund’s investment adviser from whom the broker-dealer is authorized to accept trading instructions (pursuant to Rule 613(j)(3)(ii)). In addition, if an adviser enters an order on behalf of clients that each maintain separate accounts at the broker-dealer originating the order, using those accounts, the Rule would capture both the adviser—as the person providing trading instructions to the broker-dealer (pursuant to Rule 613(j)(3)(ii))—and the clients, who are the account holders at the broker-dealer (pursuant to Rule 613(j)(3)(i)). If an adviser instead enters an order to buy or sell securities using its own account held at the broker-dealer originating the order, the Rule would capture the

adviser (pursuant to Rule 613(j)(3)(i)) but would only capture any client accounts to which the adviser allocates executed trades (pursuant to Rule 613(c)(7)(vi)) if those client accounts were held separately at the same broker-dealer as well.

Furthermore, in cases where multiple individuals in the same trading firm transact through a single account maintained at a broker-dealer in the name of that trading firm, the Rule will require the NMS plan to require recording and reporting of the Customer-ID of the trading firm associated with that account, and not the Customer-IDs of the individual traders who had placed the orders.³⁸⁸ The Commission understands that in some cases broker-dealers may have knowledge of the individual traders transacting within the same firm-wide account, and may even provide reports to the firm holding the account that summarizes trade activity according to individual trader. Because such information is not captured by the Rule, but may be useful in informing regulators about the potential manipulative activities, the SROs may wish to consider how such information might be incorporated into the consolidated audit trail in the future.

The Commission is also modifying a related provision of the Rule, Rule 613(c)(7)(i)(A), to reflect that more than one Customer-ID must be provided upon original receipt or origination of an order if the account holder and the person authorized to give the broker-dealer trading instructions for such account are different or if more than one person is an account holder for the account (such as, for example, joint account holders). Specifically, Rule 613(c)(7)(i)(A) provides that “Customer-ID(s)” (*i.e.*, multiple Customer-IDs) must be provided for each customer, if that is applicable. In addition, the Commission notes that every “customer,” as defined by Rule 613(j)(3) will be assigned a Customer-ID; thus, two Customer-IDs maybe associated with one order under the Rule.

³⁸⁸ This is because, for the purpose of Rule 613(j)(3), natural persons who are employed by an entity that is an account holder, and who are authorized to trade for that account, are not considered different from the account holders, and are therefore not covered by Rule 613(j)(3)(ii).

If an individual creates and operates two separate entities (as an employee of each such entity) that each maintain a trading account at one or more broker-dealers, the broker-dealers would be required to record and report the Customer-IDs of those entities, and not the customer ID of the individual trader.

iv. Unique Order Identifier

As proposed, the Rule would have required the NMS plan to require each member of an exchange or FINRA to attach, to each order received or originated by the member, a unique order identifier that would be reported to the central repository and that would remain with that order throughout its life, including routing, modification, execution, or cancellation. Specifically, proposed Rule 613(c)(7)(i)(D) (renumbered as Rule 613(c)(7)(i)(B)) would have provided that the national market system plan shall require each national securities exchange, national securities association, and any member of such exchange or association to collect and electronically provide to a central repository details for each order and each reportable event, including, but not limited to, “a unique identifier that will attach to the order at the time the order is received or originated by the member and remain with the order through the process of routing, modification, cancellation, and execution (in whole or in part).” In the Proposing Release, the Commission stated that the use of such an identifier would allow the SROs and the Commission to efficiently link all events in the life of an order and help create a complete audit trail across all markets and broker-dealers that handle the order.³⁸⁹ Proposed Rules 613(c)(7)(ii)(A), 613(c)(7)(iii)(A), and 613(c)(7)(v)(A) would have required the reporting of a unique order identifier to the central repository for the reportable events of routing and execution. The Commission did not propose to mandate the format of such an identifier or how the identifier would be generated.

The Commission requested comment on whether a unique order identifier that would remain with the order for its life would be necessary or useful for an effective consolidated audit trail. The Commission also specifically requested comment on, among other things, the feasibility and merits of its proposed approach for attaching a unique order identifier to an order, as well as on how multiple “child” orders that may result if the original “parent” order is subsequently broken up, or an aggregation of multiple original orders into a single order, should be addressed.

Several commenters expressed opinions on the proposed unique order identifier requirement, with some noting that the Commission’s proposal imposed “significant” burdens or challenges on market participants, and others offering alternatives to the

³⁸⁹ See Proposing Release, *supra* note 4, at 32576.

Commission's approach to identifying orders.³⁹⁰ For example, some commenters suggested that the Rule permit the approach used for OATS reporting, in which the broker-dealer initiating or receiving an order would generate its own order identifier, but pass on a separate routing identifier to the entity to which it routes the order, which would generate its own order identifier, but retain and report that routing identifier as well, so that information about the order can be linked together as it is passed from venue to venue.³⁹¹ One of these commenters also believed that the OATS approach would avoid certain complexities that could occur with a unique order identifier, such as when the original order is broken up into multiple "child" orders.³⁹² In a subsequent comment letter, the commenter stated that it could require two new order event types that would allow customer orders handled on a riskless principal or agency basis to be linked to the related representative orders.³⁹³ Another of the commenters suggested that "the adopted CAT filing should require that an order be tracked through its lifecycle and [the Commission should] leave the technical details to [a] requirements analysis."³⁹⁴

Another commenter was concerned that, if the originating firm's or customer's name was used as part of the unique order identifier, this could create "potential privacy information risks as every new destination (both internally across information barriers within a firm and externally across broker-dealers) would see where an order originated."³⁹⁵ Similarly, a third commenter supported the OATS approach of linking a series of separate order identifiers in part because it believed that, if a unique identifier were to pass from firm-to-firm, there was a

risk that information about the origin of an order might be inferred.³⁹⁶ Yet another commenter recommended that the Commission standardize how the order identifier should be structured to ensure consistent reporting between firms, instead of leaving this decision to the plan sponsors.³⁹⁷

The Commission has considered the comments received regarding the requirement that the NMS plan mandate a unique order identifier, and is adopting Rule 613 with significant modifications³⁹⁸ that provide more flexibility for the SROs, as the plan sponsors, to determine whether the NMS plan will require a single unique order identifier or a "series of order identifiers." Specifically, the Rule, as adopted, requires that every order have a "CAT-Order-ID," defined as "a unique order identifier or series of unique order identifiers that allows the central repository to efficiently and accurately link all reportable events for an order, and all orders that result from the aggregation or disaggregation of the order."³⁹⁹

The Commission has modified the Rule from the proposal so that the SROs can draw upon their own expertise, as well as those of other market participants, in developing the most accurate and efficient methodology for tracking an order through its life. Thus, the SROs may submit an NMS plan in which they require a single unique order ID to travel with each originating order; the SROs may submit an NMS plan in which, as suggested by a number of commenters, a series of order IDs, each generated by different market participants, is reported to the central repository in a manner that allows for the accurate linking of reportable events; or the SROs may submit an NMS plan based on any other methodology that meets the requirements of the Rule.

The Commission expects that the details of the methodology proposed by the SROs in the NMS plan will, in part, be based on how the generation and reporting of order identifiers would interact with other technical details involving order tracking in the consolidated audit trail, such as the

potential for multiple orders to be aggregated, routed, and disaggregated. However, though the Commission is not prescribing a particular methodology, the Rule does require that SROs take into account a number of considerations, such as accuracy and cost, in designing their methodology.⁴⁰⁰

The Commission notes that, with this modification, a wider array of possible solutions is now available to the SROs as they develop the NMS plan to be submitted to the Commission for its consideration, including those that may better accommodate the infrastructure of existing audit trails and thereby potentially, and possibly significantly, reduce implementation burdens. As indicated above, several commenters suggested that the Rule accommodate the linked order identifier approach, currently used by OATS.⁴⁰¹ However, the Commission also notes that, though the adopted Rule could accommodate such an approach, there historically have been limitations on the accuracy and reliability of linking orders in OATS.⁴⁰² It will therefore be very important for the NMS plan to demonstrate how the approach it has selected will ensure that information about all reporting events pertaining to an order will be efficiently and accurately linked together in a manner that allows regulators efficient access to a complete order audit trail.⁴⁰³ As discussed below, the reliability, accuracy, and confidentiality of the data reported to and maintained by the central repository, as well as the method by which the data in the central repository can be accessed by regulators, are considerations for the Commission in evaluating the NMS plan.⁴⁰⁴

The Commission emphasizes that, under the adopted Rule, regardless of the specific method chosen by the SROs, all orders reported to the central repository must be made available to regulators in a uniform electronic format and in a form in which all events pertaining to the same originating order are linked together in a manner that ensures timely and accurate retrieval of the information for all reportable events

³⁹⁰ See Thomson Reuters Letter, p. 3; Liquidnet Letter, p. 6-7; SIFMA Letter, p. 12; FINRA Letter, p. 7; FIF Letter, p. 3; FIF Letter II, p. 2.

³⁹¹ See Liquidnet Letter, p. 6-7; SIFMA Letter, p. 12; FINRA Letter, p. 7; FIF Letter, p. 3.

³⁹² See FINRA Letter, p. 7-8. FINRA expressed concern that, if two child orders from the same parent order are sent to the same market center, regulators would need to look at time stamps and other attributes, such as share quantity and price, to attempt to create an accurate linkage for each individual child order. FINRA stated that this complexity could be avoided if members used a separate unique routed order identifier for each routed order. *Id.*

³⁹³ See FINRA Proposal Letter, p. 7-8.

³⁹⁴ See FIF Letter II, p. 2.

³⁹⁵ See SIFMA Letter, p. 12. See also SIFMA Drop Copy Letter, p. 2 (suggesting a routed order identifier or a child order identifier which would be separate from the unique order identifier of the parent order, and would be reported to the consolidated audit trail separately on a non-real-time basis, as well as linkage information).

³⁹⁶ See FIF Letter, p. 3 (recommending the linking of the order information in a fashion similar to OATS whereby the information would only be available to regulators).

³⁹⁷ See SIFMA Letter, p. 12. In addition, another commenter suggested that order identifiers should be unique by broker and day, similar to the approach used by OATS. See Liquidnet Letter, p. 7.

³⁹⁸ See Rule 613(c)(7)(i)(B); Rule 613(c)(7)(ii)(A); Rule 613(c)(7)(iii)(A); Rule 613(c)(7)(iv)(A); Rule 613(c)(7)(v)(A); Rule 613(c)(7)(vi)(C); and Rule 613(j)(1).

³⁹⁹ See Rule 613(j)(1).

⁴⁰⁰ See Section III.C.2.a., *infra*.

⁴⁰¹ See FIF Letter, p. 3; Liquidnet Letter, p. 7; SIFMA Letter, p. 12; SIFMA Drop Copy Letter, p. 12; FINRA Letter, p. 8.

⁴⁰² See Section II.A., *supra*.

⁴⁰³ See Rule 613(j)(1). For example, one of the methods that the SROs could consider using to demonstrate the efficacy of their approach would be to engage appropriate third party experts to confirm that the system's proposed design and functionality would achieve its stated accuracy and reliability benchmarks.

⁴⁰⁴ See Section III.C.2.a.i., *infra*; Rule 613(a)(1)(iii) and (iv).

for that order.⁴⁰⁵ The Commission believes the consolidated audit trail will still achieve significant benefits with this modification.

The Commission recognizes the complexities of order routing in today's markets, including, as noted by a commenter,⁴⁰⁶ the frequent splitting of larger orders into numerous "child" orders or the bundling of smaller orders into one larger order. The Commission believes, however, that since, in today's complex markets, orders are currently and routinely aggregated and disaggregated, practical solutions to record such orders can be developed by the plan sponsors to ensure they are accurately and efficiently tracked through a variety of aggregation and disaggregation events.

With regard to the concern expressed by a commenter that the use of an order identifier(s), as required by Rule 613, could provide the ability to deduce the origin of an order, thereby revealing confidential trading strategies or raising privacy concerns,⁴⁰⁷ the Commission notes that this commenter assumed that a unique order identifier "would very likely require members to include the originating firm's or customer's name as part of the identifier."⁴⁰⁸ The Commission believes, however, that the SROs will be able to devise a way to assign order identifiers—through random number sequences or otherwise—that would protect the identity of broker-dealers and their customers from disclosure to persons other than authorized regulatory personnel. The Commission also notes that, as discussed in Section III.B.2.e. *infra*, the adopted Rule requires the NMS plan submitted to the Commission for its consideration to incorporate a variety of policies and procedures to ensure the security and confidentiality of all information reported to the central repository.

Furthermore, because the Rule requires the SROs to discuss the details of each aspect of the NMS plan submitted to the Commission for its consideration, the Commission and the public will be able to consider how well the methodology the SROs developed to link reportable events for the same order meets the considerations of accuracy and reliability, as well as those of security and confidentiality. The Commission will then be able to use this information in determining whether to approve the NMS plan submitted.

v. Time Stamp

The proposed Rule would have required SROs and their members to report the date and time, to the millisecond, that an order was originated or received, routed out, and received upon being routed, modified, cancelled, and executed.⁴⁰⁹ Specifically, proposed Rules 613(c)(7)(i)(H) (renumbered as 613(c)(7)(i)(E)), 613(c)(7)(ii)(C), 613(c)(7)(iii)(C), 613(c)(7)(iv)(B) (renumbered as 613(c)(7)(iv)(C)), and 613(c)(7)(v)(C) provided that the "time of order receipt or origination (in milliseconds)" would be recorded for every order originated or received, routed, modified, cancelled or executed, by a broker-dealer or SRO.

Several commenters expressed opinions on the time stamp requirement. One commenter believed a millisecond standard was not precise enough, explaining that many exchanges currently execute orders in less than a millisecond.⁴¹⁰ This commenter explained that, to detect the manipulative or fraudulent behavior of high frequency traders, it is necessary that time stamps be accurate to a level more detailed than the speed at which trades are executed; otherwise, it would not be possible to determine the time sequence in which trades occurred. The commenter suggested that reports from execution venues (*e.g.*, exchanges, ATSS, dark pools, and large internalizers) should be required to be accurate to 0.01 milliseconds.⁴¹¹ This commenter also suggested that a more liberal time stamp standard of one second might be more appropriate for low-volume broker-dealers.⁴¹² Another commenter, however, expressed concern about the proposed millisecond time stamp requirement, explaining that, "[a]lthough firm systems tend to capture time stamps in milliseconds, reporting in milliseconds would require changes to internal systems given that existing audit trails such as OATS require reporting of time stamps accurate only to the second."⁴¹³ Another commenter believed that, because computers have a certain rate of error when keeping time ("time drift"), it is difficult to sequence orders based

on millisecond time stamps.⁴¹⁴ As a result, according to this commenter, there is "no real value in requiring data to this level of specificity [based on milliseconds], especially if the goal of time stamping is to sequence the lifecycle of a single order as it moves from origination to execution."⁴¹⁵

The Commission has considered the comments regarding the precision of the proposed time stamp requirement for the consolidated audit trail and is adopting the millisecond time stamp requirement with modifications from the proposal.⁴¹⁶ As adopted, the Rule provides that the NMS plan submitted shall require the time stamps as set forth in Rule 613(d)(3).⁴¹⁷ Rule 613(d)(3) provides that the NMS plan must require each SRO and its members to "[u]tilize the time stamps required by paragraph (c)(7) of this section, with at minimum the granularity set forth in any national market system plan submitted pursuant to this section, which shall reflect current industry standards and be at least to the millisecond." Rule 613(d)(3) also provides that, "[t]o the extent that the relevant order handling and execution systems of any national securities exchange, national securities association, or member of such exchange or association utilize time stamps in increments finer than the minimum required by the national market system plan, such plan shall require such national securities exchange, national securities association, or member to utilize time stamps in such finer increments when providing data to the central repository, so that all reportable events reported to the central repository by any national securities exchange, national securities association, or member can be accurately sequenced." Rule 613(d)(3) further provides that "[t]he national market system plan shall require the sponsors of the national market system plan to annually evaluate whether industry standards have evolved such that the required time stamp standard should be in finer increments."

The Commission notes that SIPs currently support millisecond time stamps⁴¹⁸ and other entities in the

⁴¹⁴ See FIF Letter, p. 6–7.

⁴¹⁵ *Id.* See Section III.B.1.d.v., *infra*, for further discussions of "time drift" and the issues raised by this commenter in that regard.

⁴¹⁶ See Proposed Rules 613(c)(7)(i)(H), 613(c)(7)(ii)(C), 613(c)(7)(iii)(C), 613(c)(7)(iv)(B), and 613(c)(7)(v)(C).

⁴¹⁷ See Rules 613(c)(7)(i)(E), 613(c)(7)(ii)(C), 613(c)(7)(iii)(C), 613(c)(7)(iv)(C), and 613(c)(7)(v)(C).

⁴¹⁸ See, *e.g.*, Securities Industry Automated Corporation's ("SIAC") Consolidated Quotation System ("CQS") Output Specifications Revision 40

Continued

⁴⁰⁵ See Rule 613(e)(1).

⁴⁰⁶ See FINRA Letter, p. 4–7.

⁴⁰⁷ See SIFMA Letter, p. 12. See also FIF Letter, p. 3.

⁴⁰⁸ See SIFMA Letter, p. 12.

⁴⁰⁹ See proposed Rules 613(c)(7)(i)(H), 613(c)(7)(ii)(C), 613(c)(7)(iii)(C), 613(c)(7)(iv)(B), 613(c)(7)(v)(C).

⁴¹⁰ See Endace Letter, p. 1–2.

⁴¹¹ See Endace Letter, p. 1. The Commission notes that this commenter also suggested that the same time increment be extended to market data feeds to help increase transparency and deter fraudulent activity; however, this comment is outside the scope of this Release.

⁴¹² *Id.* at 2–3.

⁴¹³ See SIFMA Letter, p. 14.

securities industry currently conduct business in millisecond increments or finer.⁴¹⁹ The Commission believes that, given the speed with which the industry currently handles orders and executes trades, it is important that the consolidated audit trail utilize a time stamp that will enable regulators to better determine the order in which reportable events occur. The entry time of orders can be critical to enforcement cases. For example, the timing between order origination and order entry is important in investigating possible market abuse violations, such as trading ahead of a customer order. In general, determining whether a series of orders rapidly entered by a particular market participant is manipulative or otherwise violates SRO rules or federal securities laws, otherwise being able to reconstruct market activity, or performing other detailed analyses, requires the audit trail to sequence each order accurately. The Commission believes that, for many types of common market activities that operate at the level of milliseconds or less, time stamps in increments greater than a millisecond would not allow this sequencing with any reasonable degree of reliability.

In response to the comment that a millisecond standard is not sufficiently precise, as many exchanges currently execute orders in less than a millisecond,⁴²⁰ adopted Rule 613(d)(3) provides that the NMS plan must require that, to the extent that the order handling and execution systems of any SRO or broker-dealer utilize time stamps in increments finer than the minimum required by the NMS plan time stamps, such SRO or member must use time stamps in such finer increments when reporting data to the central repository, so that reportable events reported to the central repository by any SRO or member can be accurately sequenced. The Commission believes this approach will improve the accuracy of records with respect to the sequencing of events that occur very rapidly, especially with respect to those market participants that have elected to use time stamps in increments finer than a millisecond.

The Commission recognizes, as a commenter noted,⁴²¹ that computers

(January 11, 2010); SIAC's Consolidated Tape Service ("CTS") Output Specifications Revision 55 (January 11, 2010); and Nasdaq's Unlisted Trading Privileges Plan Quotation Data Feed Interface Specifications Version 12.0a (November 9, 2009).

⁴¹⁹ See, e.g., http://batstrading.com/resources/features/bats_exchange_Latency.pdf (describing, among other things, the time it takes to accept, process, and acknowledge or fill a member order).

⁴²⁰ See Endace Letter, p. 1.

⁴²¹ See FIF Letter, p. 7.

have a certain rate of deviation when keeping time. The requirement that clocks be synchronized within a level of granularity to be specified in the NMS plan⁴²² is designed to ensure that time drift does not exceed a defined level of deviation. However, the Commission believes that time stamps reported with a millisecond or finer granularity would still provide significant benefits even, contrary to one commenter's assertion,⁴²³ if the time drift between systems is larger than a millisecond. This is because such time stamps would still allow an accurate sequencing of reportable events as may commonly occur within in a single system, tied to a single clock, at levels of a millisecond or finer (e.g., high-frequency trading algorithms). Any drift of such a system's clock relative to the clocks of other systems may of course hinder the time-sequencing of cross-system events, but it would not preclude the ability of regulators from performing a detailed, accurate time-sequenced analysis of all the orders, cancellations, modifications, and executions performed by the specific system of interest.⁴²⁴ In this regard, the Rule is analogous to the current requirements for OATS reporting: FINRA requires clocks to be synchronized to the second, and requires time stamps to be reported to FINRA in seconds, unless those time stamps are captured by the FINRA member in milliseconds, in which case they must reported to FINRA in milliseconds (notwithstanding the clock sync remaining at a second).⁴²⁵

The Commission acknowledges that changes (with their associated costs) might be required to internal broker-dealer systems to comply with a millisecond time stamp requirement. However, given the benefits outlined above, and the apparent widespread use of millisecond time stamps in the industry today,⁴²⁶ the Commission

⁴²² See Section III.B.1.h., *infra*, for a discussion of clock synchronization.

⁴²³ See FIF Letter, p. 6–7.

⁴²⁴ Similarly, although reporting in increments finer than a millisecond would also enable the accurate time-sequencing of events originating from within a single system or systems operating off the same clock, the Commission recognizes that the effects of time drift across the clocks of different systems could limit the efficacy of time-sequencing sub-millisecond events across those systems.

⁴²⁵ See FINRA's Order Audit Trail System, Frequently Asked Questions, <http://www.finra.org/Industry/Compliance/MarketTransparency/OATS/NMS/P122893> (last visited on May 15, 2012).

⁴²⁶ See Endace Letter, p. 1 (stating that "[t]oday Exchanges such as NYSE Euronext and BATS are claiming that they are executing orders in less than a millisecond (see Wall Street Journal on the January 6th 2010) and are displaying details of these trades in increments of milliseconds on their market data feeds. Clearly from an Exchange perspective the publishing of trade data at one

believes the cost of requiring the SROs to develop a plan that provides for millisecond time stamps, and to discuss the costs and benefits of the specific solution chosen, is justified.

The Commission also acknowledges that broker-dealers who presently report time stamps to OATS in millisecond increments, but whose systems direct and capture their order activity in finer time increments, could incur costs associated with these time stamps being reported to the central repository with the same granularity at which they are recorded by the broker-dealers.⁴²⁷ The Commission recognizes that there may be alternatives to reporting events in finer than millisecond increments that enable the central repository to use a different method for accurately time-sequencing sub-millisecond events originating from within a system or systems on a single clock. Therefore, in developing the NMS plan to be submitted to the Commission for its consideration, if the SROs identify one or more such alternatives, the Commission believes that they should address such alternatives in the NMS plan,⁴²⁸ how such alternatives (i.e., an alternative to reporting in finer than millisecond increments) would ensure that reportable events may be accurately time-sequenced at the sub-millisecond level, and the costs associated with such alternatives both on their own terms and relative to a requirement to report events in the same sub-millisecond time stamp as used by a broker-dealer for directing and capturing orders.⁴²⁹

The Commission also notes that, because millisecond time stamps may become inadequate to investigate trading as technology evolves and trading speeds increase, the adopted Rule requires that the NMS plan submitted to the Commission for its consideration require the plan sponsors to annually evaluate whether industry standards have evolved such that a finer increment time stamp is appropriate. As this approach is tied to the then-current industry standard used to assess whether to shorten the future time stamp increment, the Commission also believes that this approach helps assure that the time stamps in the consolidated

millisecond increments is not just possible, its current practice. However, Endace believes that one millisecond increments is not good enough"); SIFMA Letter, p. 14 (acknowledging that, "[a]lthough firm systems tend to capture time stamps in milliseconds, reporting in milliseconds would require changes to internal systems given that existing audit trails such as OATS require reporting of time stamps accurate only to the second").

⁴²⁷ See SIFMA Letter, p. 14.

⁴²⁸ See Rule 613(a)(1)(xii).

⁴²⁹ See Rule 613(a)(1)(vii).

audit trail will be in line with technological developments. Should the industry standard move to a finer time standard, the plan sponsors could modify the minimum standard required by the NMS plan by submitting an amendment to the NMS plan under Rule 608 of Regulation NMS. Such an amendment would need to be considered and would be subject to approval by the Commission, as well as subject to public notice and comment.⁴³⁰

vi. Additional Routing Data Elements

Proposed Rules 613(c)(7)(ii) and (iii) would have required that certain additional information be collected and reported specifically to allow regulators to track the life of an order through the routing process. The Commission requested comment as to whether information regarding the routing of orders would be necessary or useful for an effective consolidated audit trail, and asked if any information, in addition to the data elements proposed, should be included in the consolidated audit trail relating to routing.

One commenter noted that the proposed Rule would capture the routing of an order internally within a broker-dealer, but not the routing of an order internally within an exchange from one execution system to another.⁴³¹ This commenter also noted that, as proposed, the Rule would not require an SRO or member to report information indicating that an order was “flashed” or otherwise displayed in a “step-up” mechanism.⁴³² The commenter believed that this information would be important for the consolidated audit trail to capture.⁴³³

The Commission believes that it is important to capture the routing of an order internally within a broker-dealer to, for example, evaluate best execution practices.⁴³⁴ Capturing the time at which a broker-dealer received a customer’s order and the time that such order was executed can help determine if the broker-dealer delayed acting on its customer’s order. The time at which an order was routed can affect the evaluation of whether the broker-dealer fulfilled its best execution obligations, and, thus, the Commission believes that this internal broker-dealer routing information should be captured by Rule 613. The Commission, however, does

not believe that data regarding order processing (*i.e.*, management of an order) within exchange systems is as useful as data regarding internal routing within a broker-dealer⁴³⁵ because, for example, unlike broker-dealers, exchanges do not have best execution obligations. Further, any issues with an SRO’s internal processing would occur at a single venue—the SRO—and, thus, there could be direct follow-up with the SRO. Additionally, the Commission notes that the consolidated audit trail will not collect information indicating whether orders were flashed or displayed in a “step-up” mechanism as it concerns an exchange’s internal processing and dissemination to its members of an order in the instance when the exchange cannot execute the order because the exchange does not have any available trading interest at the NBBO (depending on the side of the order).⁴³⁶ Orders that are flashed or displayed through a “step-up” mechanism are not executable because they are displayed only to members of an exchange as an indication of a broker-dealer’s interest. The Commission believes it is appropriate not to require the reporting of these flashed or “stepped-up” orders to the central repository because, as noted above, the Commission believes that the tracing of processes within an exchange is not as material to regulators as the routing of orders between markets. Further, as stated, SROs do not have the same legal obligations with regard to handling customer orders as broker-dealers; therefore, the Commission does not believe it is necessary, at this time, to require the consolidated audit trail to track an SRO’s internal processing of orders.

The Commission has considered the comments related to the data that is required to be recorded and reported when an order is routed and is adopting Rules 613(c)(7)(ii) and (iii) substantially as proposed.⁴³⁷ The Commission notes

⁴³⁵ The Commission acknowledges that certain orders received by an exchange may be routed to another exchange; however, the routing of such an order to the other exchange is largely subject to the rules of the exchange and Rule 613 will capture such routing as a reportable event.

⁴³⁶ In general, flash orders are communicated to certain market participants and either executed immediately or withdrawn immediately after communication. The Commission has proposed and sought comment on whether to amend Rule 602 of Regulation NMS under the Exchange Act to eliminate an exception for the use of flash orders by equity and options exchanges. See Securities Exchange Act Release Nos. 60684 (September 18, 2009), 74 FR 48632 (September 23, 2009); 62445 (July 2, 2010), 75 FR 39625 (July 9, 2010).

⁴³⁷ See Section III.B.1.d.vi., *supra*, for a discussion of the modifications to Rule 613(c)(7)(ii) through (iii).

that the Rule requires that the NMS plan require the broker-dealer routing an order and the broker-dealer receiving a routed order—both actions that are defined as “reportable events” under Rule 613—record and report the CAT-Reporter-ID of the broker-dealer routing the order and the CAT-Reporter-ID of the broker-dealer receiving the routed order. The Commission believes the requirement to report this information on both the routing and receiving end of a route is not duplicative but, rather, is useful. Specifically, information regarding when a broker-dealer received a routed order could prove useful in an investigation of allegations of best execution violations to see if, for example, there were delays in executing an order that could have been executed earlier. In addition, if a market participant is required to report when it receives an order, regulators could solely rely on information gathered directly from that market participant when examining or investigating the market participant. For example, if a regulator needs to investigate a delay between the time a market participant received an order and the time the market participant acted on the order, under Rule 613, as adopted, the regulator could use information recorded and reported by the market participant itself, rather than rely on information about the receipt and action taken on the order that would be provided by a third party. Information from a third party may be less accurate in general and may not accurately reflect events to the extent there are latencies in order transmission. In addition, the Commission relies on data such as that which would be recorded under Rule 613(c)(7)(ii) and (iii) to improve its understanding of how markets operate and evolve, including with respect to the development of new trading practices, the reconstruction of atypical or novel market events, and the implications of new markets or market rules. For these reasons, the Commission believes that it is important to have both the routing broker-dealer and the receiving broker-dealer report their CAT-Reporter-IDs to the central repository, and that such information could aid regulatory authorities when analyzing the trades of market participants.⁴³⁸

To reflect terms that have been modified elsewhere in the Rule as

⁴³⁸ The Commission notes that OATS rules also require both the FINRA reporting member routing an order and the FINRA reporting member receiving the order to record and report certain audit trail data. See FINRA Rule 7440(C). See also Rule 613(c)(7)(ii)(D) and Rule 613(c)(7)(iii)(D) through (E).

⁴³⁰ See Rule 608(b)(1) under Regulation NMS, 17 CFR 242.608(b)(1).

⁴³¹ See GETCO Letter, p. 4.

⁴³² *Id.*

⁴³³ *Id.*

⁴³⁴ OATS rules currently require the recording and reporting of orders routed internally. See FINRA Rule 7440(c).

adopted, the terms “unique order identifier” and “unique identifier” in Rule 613(c)(7)(ii) and (iii) have been replaced with the terms “CAT-Order-ID” and “CAT-Reporter-ID.” In addition, Rule 613(c)(7)(ii) and (iii) now reflect the new time stamp requirement contained in Rule 613(d)(3). Specifically, Rules 613(c)(7)(ii)(C) and 613(c)(7)(iii)(C) provide that the time at which an order is routed or received must be recorded and reported pursuant to Rule 613(d)(3), rather than simply in milliseconds as proposed. The Commission believes these conforming changes are appropriate to reflect the revised terms in the adopted Rule.

vii. Additional Modification, Cancellation, or Execution Data Elements

In addition to the data elements discussed above, proposed Rules 613(c)(7)(iv) and (v) would have required that certain information be collected and provided specifically to allow regulators to track the life of an order through modification, cancellation, or execution. The Commission requested comment as to whether information required under the Rule as proposed would be sufficient to create a complete and accurate consolidated audit trail, and asked if any information, in addition to the data elements proposed, should be included in the consolidated audit trail relating to modifications, cancellations, or executions.

In response, one commenter noted that broker-dealer order management systems may differ in their treatment of order modifications and cancellations, as some, for example, may capture or report only modified data elements, and not necessarily all of the elements of a modified order.⁴³⁹ The commenter recommended that the consolidated audit trail accommodate such differences, and further suggested requiring only the submission of the order identifier for a cancelled order, not the order’s other data elements.⁴⁴⁰ Another commenter believed that, “[a]s in the case of the current OATS system, execution data provided to the consolidated audit trail should identify where the trade was publicly reported and have a common identifier that links the audit trail execution reports for the buy and sell orders to the public trade report.”⁴⁴¹

After consideration of the comments regarding the specific audit trail data required for orders that are modified,

cancelled, or executed, the Commission is adopting Rules 613(c)(7)(iv) and (v) substantially as proposed, with a modification to require that the NMS plan include a requirement that the CAT-Order-ID for such orders also be recorded and reported to the central repository. This modification is designed to ensure that an order identifier be reported for orders that have been modified or cancelled. The Commission believes that the order identifier is a critical piece of information that will efficiently link an order across markets. Adopted Rules 613(c)(7)(iv) and (v) will also require that the NMS plan submitted to the Commission for its consideration require the recording and reporting of the CAT-Reporter-ID of the broker-dealer or Customer-ID of the person giving the modification or cancellation instruction to reflect the new terminology of the adopted Rule. In addition, Rules 613(c)(7)(iv) and (v) reflect the new time stamp requirement contained in Rule 613(d)(3), as adopted. Specifically, Rules 613(c)(7)(iv)(C) and 613(c)(7)(v)(C) provide that the time at which an order is modified, cancelled, or executed must be recorded and reported pursuant to Rule 613(d)(3), rather than simply in milliseconds as proposed.

The Commission believes it is necessary to require the NMS plan to require the information under Rule 613(c)(7)(iv) and (v) for each order and reportable event because it will assist the Commission and SROs in identifying all changes made to an order (including an execution) and those market participants responsible for the changes (or execution). The Commission believes this information, in combination with the proposed information pertaining to order receipt or origination, will provide regulators with a comprehensive view of all material stages and participants in the life of an order. Among other things, this order information should help regulators investigate suspicious trading activity in a more efficient manner than is currently possible. Regulators will have access to information identifying the customer behind the order and will also see how a customer’s order is handled across markets. This data also will improve regulators’ understanding of how markets operate and evolve, including with respect to the development of new trading practices, the reconstruction of atypical or novel market events, and the implications of new markets or market rules. In addition, the Commission believes that most of the data proposed to be

recorded and reported by the Rule for order modification, cancellation, and execution is data that most broker-dealers already generate in the course of handling an order pursuant to the existing audit trail requirements of several SROs.⁴⁴²

The Commission notes that regulatory staff at an SRO or the Commission could use execution information required under Rule 613(c)(7)(v), which will be consolidated with the other audit trail information required under Rule 613 to, for example, detect patterns of reported and unreported transactions effected by a broker-dealer in a particular security by comparing the data reported to the central repository regarding an execution with information reported pursuant to a transaction reporting plan or the OPRA Plan. Depending on the results of that analysis, regulators may undertake further inquiry into the nature of trading by that broker-dealer to determine whether the public received accurate and timely information regarding executions, and whether the broker-dealer complied with the trade reporting obligations contained in SRO rules. Patterns of reported and unreported transactions by a particular broker-dealer could also be indicia of market abuse, including the failure to obtain the best execution for customer orders, or possible market manipulation. Thus, the ability to compare the consolidated order execution data, including customer information, with the trades reported to the consolidated tape would be an important component of an effective market surveillance program that is not possible today because regulators currently do not have access to comprehensive cross-market audit trail data, and the process of identifying customers is very labor intensive, time-consuming, and error prone.

In response to the commenter that recommended that the consolidated audit trail accommodate differences in the treatment of modifications by broker-dealer order management systems (*i.e.*, those that report only the modified data elements, not the entire order), and suggested that only an order identifier be reported for a cancellation, not the cancelled order’s other data elements,⁴⁴³ the Commission notes that Rule 613 does not require all of the data elements of a modified order to be reported to the central repository. The Rule only requires the NMS plan to require the reporting of the CAT-Order-ID; the date and time the modification

⁴³⁹ See SIFMA Drop Copy Letter, p. 4.

⁴⁴⁰ *Id.*

⁴⁴¹ See Liquidnet Letter, p. 7.

⁴⁴² See, *e.g.*, FINRA Rule 7440(d); Nasdaq Rule 6950; NYSE Rule 132B.

⁴⁴³ See SIFMA Drop Copy Letter, p. 4.

is received or originated; the CAT-Reporter ID of the broker-dealer or the Customer-ID of the person giving the modification instruction; if modified, the price and remaining size of the order; and any other changes to the material terms of the order. The adopted Rule also requires the NMS plan to require the date and time a cancellation is received or originated and the CAT-Reporter-ID of the broker-dealer, or Customer-ID of the person, giving the cancellation instruction to be reported to the central repository. The Commission believes this will ensure that regulators can determine the market participant or person responsible for the cancellation of an order,⁴⁴⁴ and the date and time of the cancellation.

In response to the commenter that suggested that the Rule should require that the execution data be linked with the public trade report using a common identifier,⁴⁴⁵ the Commission notes that Rule 613(c)(7)(v)(G) requires the NMS plan submitted to the Commission for its consideration to require that, for an order that has been executed, the SRO or member that executes the order must report to the central repository whether the execution was reported pursuant to an effective transaction reporting plan or OPRA, as applicable. The Commission has considered the commenter's further suggestion that a common identifier link the audit trail execution reports for the buy and sell orders to the public trade report and is not mandating such a requirement under Rule 613; the Commission believes that Rule 613 and its requirements provide a sufficient initial framework for collecting audit trail data that will enhance the ability of regulators to surveil the market for NMS securities.⁴⁴⁶ Accordingly, the Commission is adopting Rule 613(c)(7)(v)(G), as proposed, which requires that the plan sponsors include in the NMS plan submitted to the Commission for its consideration a requirement that the broker-dealer report to the central repository whether a trade was reported pursuant to an effective transaction reporting plan or OPRA.

⁴⁴⁴ See Section III.B.1.iii., *supra*.

⁴⁴⁵ See Liquidnet Letter, p. 7.

⁴⁴⁶ While the Commission is not requiring that execution data be linked with the public trade report using a common identifier, the Commission notes that the Rule does not prohibit the SROs from including a provision in the NMS plan for the establishment of a common identifier to link the audit trail execution reports for buy and sell orders to the public trade report.

e. Rule 613(c)(3): Information To Be Recorded Contemporaneously With the Reportable Event and Reported to the Central Repository by 8:00 a.m. Eastern Time on the Trading Day Following the Day Such Information Has Been Recorded

i. Proposed Rule 613(c)(3)

As proposed, Rule 613(c)(3) would have required the NMS plan to require each SRO and member to collect and provide to the central repository, on a "real time" basis, key data for each order and each reportable event, including the origination or receipt of an order, as well as the routing, cancellation, modification, or execution of the order.⁴⁴⁷ Specifically, the proposed Rule would have provided that "[t]he national market system plan submitted pursuant to this section shall require each national securities exchange, national securities association, and member to collect and provide to the central repository the information required by paragraphs (c)(7)(i) through (v) of this section on a real time basis."⁴⁴⁸ In the Proposing Release, the Commission noted that "real time" meant "immediately and with no built in delay from when the reportable event occurs."⁴⁴⁹

ii. Comments on Proposed Rule 613(c)(3)

The Commission received a variety of comments about the achievability of the real-time requirement; the accuracy of audit trail data that would be collected and provided in real time; the necessity, merits and usefulness of real-time audit trail data; the costs of real-time reporting; and the proposed Rule's requirement that all audit trail data be collected and reported in real time. These comments are discussed below.

Several commenters believed that reporting data on a real-time basis was achievable.⁴⁵⁰ Of these comments, one commenter stated that its current systems could be used to support real-time reporting, and that real-time reporting may be easier to achieve than intraday or end-of-day batch processing.⁴⁵¹ Similarly, another commenter, endorsing the use of FIX Protocol, stated that FIX Protocol is

⁴⁴⁷ See Rule 613(j)(9) for a definition of "reportable event."

⁴⁴⁸ See proposed Rule 613(c)(3).

⁴⁴⁹ See Proposing Release, *supra* note 4, at 32572.

⁴⁵⁰ See Thomson Reuters Letter, p. 3; Aditat Letter, p. 2; FTEN Letter p. 3; Ameritrade Letter, p. 1 (stating that the scalability of its systems could support real-time reporting); Nasdaq Letter II, p. 3 (stating that a platform supported by FTEN and SMARTS technology would support the real-time provision of data).

⁴⁵¹ See Ameritrade Letter, p. 1.

already widely used throughout the financial industry, and that "[a]ll FIX messages are generated in real time for trading."⁴⁵²

A significant number of commenters, however, expressed concern about the proposed requirement that the audit trail data be collected and provided to the central repository in real time.⁴⁵³ Some of these commenters focused on the effect a real-time reporting requirement would have on their systems, and the systems changes that might be needed to achieve real-time reporting. Specifically, commenters argued that a real-time collection and provision requirement would require many industry participants to build entirely new systems or to undertake significant technological upgrades to comply with a real-time reporting requirement.⁴⁵⁴ Other commenters stated that real-time reporting would strain their order handling systems and result in latencies and delays in the processing of customer orders.⁴⁵⁵ Additionally, one commenter questioned the ability of a real-time consolidated audit trail system to handle periods of immense volume, like the volume on May 6, 2010.⁴⁵⁶

Other commenters who expressed concern about the real-time reporting requirement questioned the accuracy of data that would be reported in real

⁴⁵² See Aditat Letter, pp. 1–2. FIX Protocol is a series of messaging specifications for the electronic communication of trade-related messages. It has been developed through the collaboration of banks, broker-dealers, exchanges, industry utilities and associations, institutional investors, and information technology providers from around the world. See *What is FIX? available at <http://fixprotocol.org/what-is-fix.shtml>* (last visited on May 7, 2011).

⁴⁵³ See Scottrade Letter, p. 1; ICI Letter, pp. 4–6; FINRA/NYSE Euronext Letter, p. 4; GETCO Letter, p. 2; BATS Letter, pp. 1–2; SIFMA Letter, pp. 3–8; SIFMA February 2012 Letter, p. 1; CBOE Letter, pp. 4–5; Direct Edge Letter, p. 3; FINRA Letter, pp. 10–13; Wells Fargo Letter, p. 3; Knight Letter, pp. 2–3; Leuchtkafer Letter; Broadridge Letter, p. 3; FIF Letter, p. 4; SIFMA Drop Copy Letter, p. 1; Ross Letter, p. 1; FINRA Proposal Letter, p. 3; FIA Letter, pp. 1–2.

⁴⁵⁴ See Scottrade Letter, pp. 1–2; ICI Letter, pp. 4–5; SIFMA Letter, pp. 4–5; Knight Letter, p. 2. See also BATS Letter, p. 2; Broadridge Letter, p. 3; FIF Letter, p. 4; GETCO Letter, pp. 3–4; CBOE Letter, p. 4; FIA Letter, p. 2. In particular, FIA noted its belief that "real-time reporting accounts for a significant portion of the considerable costs associated with the CAT." See FIA Letter, p. 2.

⁴⁵⁵ See FINRA/NYSE Euronext Letter, p. 5; FINRA Letter, p. 13; SIFMA Letter, p. 5; CBOE Letter, p. 4 (stating that, "given the increased speed of order submission, quote changes, and order cancellation, modifications and executions, a real time submission requirement could strain the systems capacities and computer resources of SROs and many member firms").

⁴⁵⁶ See FINRA Letter, p. 13. See also Berkeley Letter, p. 2 (noting the "peta-scale" problem of collecting audit trail data generally).

time.⁴⁵⁷ One commenter, for example, noted that there would not be an opportunity for data validation if consolidated audit trail data were required to be reported in real time.⁴⁵⁸ Another commenter stated that the real-time processing required by real-time reporting would create data integrity issues and, thus, lead to poorer data quality as compared to an approach with a more liberal timeframe, such as next day, or “T+1,” reporting.⁴⁵⁹ FINRA similarly commented that the data integrity issues that arise when audit trail data is provided on a T+1 basis would be exacerbated by a real-time system.⁴⁶⁰ FINRA stated that it performs over 40 billion data validations of order events submitted through OATS every day, and requires its members to repair rejected OATS data.⁴⁶¹

A number of commenters discussed whether a real-time reporting requirement is necessary. One commenter stressed that the real-time availability of data would facilitate the identification of cross-market events and their origins.⁴⁶² This commenter explained that a platform developed using FTEN and SMARTS technology would include real-time risk management and surveillance capabilities.⁴⁶³ However, most

commenters did not believe that real-time data typically would be useful to the Commission and SROs.⁴⁶⁴ One commenter explained that using audit trail data before having an opportunity to validate it “may result in a severely distorted picture of trading and interfere with effective oversight.”⁴⁶⁵ Another commenter stated that “real-time order information is inherently incomplete and could even be inaccurate and therefore misleading to the users of the data.”⁴⁶⁶ Some commenters were of the view that the Commission had significantly overvalued the regulatory benefit of real-time data.⁴⁶⁷ One of these commenters noted that, “[b]ased on its experience in conducting surveillance, [it] does not believe that it is essential that all of the information proposed to be captured in the CAT be received real time or near-real-time.”⁴⁶⁸ A commenter suggested that, to the extent any information had to be submitted in real time, it should be limited to data related to certain key events, such as order receipt and origination, order transmittal, execution, modification, and cancellation.⁴⁶⁹ Other commenters generally questioned the value of real-time audit trail data, arguing that regulators would still need to rely on traditional investigative techniques, such as taking testimony, to establish securities law violations.⁴⁷⁰ Another commenter believed that “[m]any potential uses for the data, including enforcement inquiries probing market behavior, may require either multiple days’ worth of data, or data from other markets that is not available on a real-time basis,” limiting the ability to use such real-time data provided by the consolidated audit trail.⁴⁷¹

Some commenters questioned whether the substantial costs that would be associated with providing the data on a real-time basis would outweigh the benefits.⁴⁷² One commenter believed that “the SEC has significantly

overestimated the incremental utility of real-time data over data received on a T+1 basis” and that “the costs associated with the breadth of real-time reporting proposed by the Commission would be significant and far outweigh the minimal regulatory benefit gained by such a reporting system.”⁴⁷³

Some commenters who questioned the value of the real-time reporting requirement also suggested that the Commission consider a different timeframe for the reporting of audit trail information. Several commenters, for example, suggested a later timeframe for reporting audit trail data to the central repository. One commenter, an exchange, stated that “[o]ur strong preference would be for submission of information to the central repository through a batch process after the close of the trading day involved.”⁴⁷⁴ Another commenter suggested a compromise whereby broker-dealers would be subject to next day (or later) reporting requirements, while the SROs could leverage their existing real-time monitoring tools and provide real-time trading information for use in the consolidated audit trail.⁴⁷⁵ Several commenters recommended that the Commission permit end-of-day reporting.⁴⁷⁶ One commenter noted that end-of-day reporting would alleviate some of the practical challenges firms would face with a requirement to identify beneficial owners on a real-time basis.⁴⁷⁷ Another commenter suggested that a reporting deadline of 10–15 minutes would be substantially more workable than a “real-time” reporting requirement.⁴⁷⁸ Finally, one commenter

⁴⁷³ See FINRA/NYSE Euronext Letter, p. 4. Similarly, FINRA believes “the SEC has significantly overvalued the regulatory benefits to be achieved * * * while underestimating some of the problems with relying on real-time data. This is true not only because certain information is difficult, if not impossible, to provide on a real-time basis, but also because real-time data is less reliable.” See FINRA Letter, p. 10–11. See also SIFMA February 2012 Letter, p. 1 (stating, “[a]ny potential incremental benefit of receiving this information on a real-time basis is, in our view, substantially outweighed by the additional expense and implementation delays associated with building and maintaining a real-time system”); FIA Letter, p. 2 (“It is not apparent to us from the Proposal that the additional costs associated with a real-time audit trail, compared to a T+1 audit trail, would be offset by any incremental benefits to the Commission.”).

⁴⁷⁴ See CBOE Letter, p. 4.

⁴⁷⁵ See SIFMA Letter, p. 3; see also SIFMA February 2012 Letter, p. 1 (questioning the regulatory need for real-time data versus data provided on an “end-of-day or ‘T+1’ basis”); FIA Letter, p. 2.

⁴⁷⁶ See Scottrade Letter, p. 2; ICI Letter, p. 5; BATS Letter, p. 2; Angel Letter, p. 3; Broadridge Letter, p. 3.

⁴⁷⁷ See ICI Letter, p. 6.

⁴⁷⁸ See SIFMA Drop Copy Letter, p. 1. The commenter stated that “implementation options

⁴⁵⁷ See FINRA/NYSE Euronext Letter, p. 5–6; Knight Letter, p. 2–3; CBOE Letter, p. 4; Wells Fargo Letter, p. 3; FINRA Letter, p. 11–12; SIFMA Letter, p. 5; Direct Edge Letter, p. 3; FIA Letter, p. 2.

⁴⁵⁸ See FINRA/NYSE Euronext Letter, p. 5–6 (noting that “drawing conclusions based solely on real time data increases the potential for inaccuracy because the data has not gone through the full range of validations * * *”). See also Wells Fargo Letter, p. 3 (“[A]ccurate market information often does not happen in real time.”); FINRA Letter, p. 11–12 (stating that current order-handling practices make “accurate real time order reporting problematic, and automated surveillance is only useful if the underlying data is accurate and complete * * *.”); SIFMA Letter, p. 5 (“There also would be data integrity costs in the form of less reliable data, or data that would have to be revised or resubmitted where it otherwise may not have been required if firms had a short window of time to more thoroughly ‘scrub’ or validate their submissions.”); Direct Edge Letter, p. 3 (“Real-time data may be less reliable than information collected after the validations that come with settling a transaction.”).

⁴⁵⁹ See Knight Letter, p. 2–3. See also CBOE Letter, p. 4 (“[G]enerally our belief is that next day (T+1) data, which incorporates additional information such as cleared trade data, is a better report resource for generating surveillance and compliance reviews.”); FINRA/NYSE Euronext Letter, p. 6 (stating that, “from a market surveillance standpoint, reliable and complete data received on a T+1 basis * * * is generally superior to unvalidated real-time data”); FIA Letter, p. 2 (“We believe the Commission’s Proposal overvalues any potential benefits achieved by real-time reporting as compared to reporting on day after trade, or ‘T+1,’ basis.”).

⁴⁶⁰ See FINRA Letter, p. 11–12.

⁴⁶¹ *Id.* at p. 11.

⁴⁶² See Nasdaq Letter I, p. 9–10.

⁴⁶³ See Nasdaq Letter II, p. 3.

⁴⁶⁴ See ICI Letter, p. 5; Leuchtkafer Letter; GETCO Letter, p. 2; FIA Letter, p. 2; Scottrade Letter, p. 2; BATS Letter, p. 2; Angel Letter, p. 3; Broadridge Letter, p. 3; CBOE Letter, p. 4; FINRA/NYSE Euronext Letter, p. 4, 6; FINRA Letter, p. 11; SIFMA Letter, p. 3, 7; SIFMA Drop Copy Letter, p. 1; FINRA Proposal Letter, p. 4, 10–11.

⁴⁶⁵ See FINRA Letter, p. 11.

⁴⁶⁶ See SIFMA February 2012 Letter, p. 1.

⁴⁶⁷ See FINRA/NYSE Euronext Letter, p. 4; FINRA Letter, p. 11; FIA Letter, p. 2.

⁴⁶⁸ See FINRA Proposal Letter, p. 4.

⁴⁶⁹ See SIFMA Drop Copy Letter, p. 1–2. See also FINRA Proposal Letter, p. 10.

⁴⁷⁰ See GETCO Letter, p. 2; BATS Letter, p. 2.

⁴⁷¹ See FIA Letter, p. 2.

⁴⁷² See Scottrade Letter, p. 1–2; FINRA/NYSE Euronext Letter, p. 4; GETCO Letter, p. 2; BATS Letter, p. 2; SIFMA Letter, p. 3–8; SIFMA February 2012 Letter, p. 1; CBOE Letter, p. 4; FINRA Letter, p. 11–13; Wells Fargo Letter, p. 3; FIA Letter, p. 2.

suggested that broker-dealers and SROs should retain audit trail information, and submit it only upon regulatory request, so that the central repository would only collect data needed for investigations or surveillance purposes.⁴⁷⁹

One commenter, who did not specifically advocate either real time or reporting on an end-of-day basis, supported a requirement that all trades be reported in a standardized format that will be accessible to the SEC at the end of each trading day.⁴⁸⁰

Some commenters suggested alternative means of collecting audit trail information, assuming such audit trail data would not be on a real-time basis and would not be through the reporting regime set forth by Rule 613. For example, one commenter suggested the Commission consider “a consolidation” of [OATS] and [COATS], audit trails that are produced on a T+1 basis; and a review of the prospect of extracting specific real-time data from surveillance reports currently used by SROs to perform post trade analysis, such as the Large Option Position Report * * * and large trader reports, to obtain real-time risk information that may impact a particular NMS issue or the market in general.”⁴⁸¹ This commenter believed that a requirement of real-time reporting should be considered only after other available sources of data have been carefully reviewed, and only to the extent that such a requirement is both necessary

and complexity are significantly different if the reporting regime is within ‘minutes’ rather than ‘seconds.’ If real-time reporting is required in seconds, then significant re-engineering is required within broker-dealer order management systems and trading systems to support such a requirement (e.g., passing additional information between systems, performance tuning to compensate for additional processing of payload). Instead, if the definition of real-time allows for reporting within minutes (e.g., 10–15 minutes) of the events, it would be substantially less intrusive on order management systems and may allow for greater flexibility in designing reporting systems architecture and more standardized content for events such as order modifications, as described below. Also, as with prior implementations of new trade reporting regimes in the U.S. (e.g., ACT and TRACE), having more liberal reporting timeframes for an appropriate initial period (e.g., 12 months or more) to provide a sufficient period to optimize processes would be very helpful.” This commenter also questioned “the need for real-time reporting of the entire set of data elements in the CAT proposal,” and believed that “reporting on a T+1 (or in some cases later) basis should satisfy the SEC’s stated regulatory objectives more efficiently.” *Id.* See also Nasdaq Letter II, p. 3 (stating its proposed platform could support the provision of data in real time or within 10–15 minutes using drop copies).

⁴⁷⁹ See GETCO Letter, p. 4. The commenter also believed this approach would lower the costs of the consolidated audit trail.

⁴⁸⁰ See Bean Letter, p. 1.

⁴⁸¹ See BOX Letter, p. 2.

and economically feasible.⁴⁸² Another commenter, however, urged the Commission not to “lower its expectations for the CAT and accept a more limited audit trail based exclusively on existing systems.”⁴⁸³ One commenter suggested that the Commission consider a “hybrid” approach that would enhance elements of the quotation and transaction information reported in real time, while collecting and reporting more specific order information on a T+1 basis or later.⁴⁸⁴

Two commenters commented on the meaning of “real time.”⁴⁸⁵ One commenter noted that “[our members] request clarification on the definition of real-time data submission as it relates to each data element required by CAT. The granularity/definition of real-time for each element will have a major impact on SROs, their members and CAT system development from both a data quality and database design perspective . . . * * *”⁴⁸⁶ The other commenter noted that the “[t]he term ‘real time’ is used throughout the document, but never defined. (There are several distinct meanings in the computer industry.)”⁴⁸⁷

The Commission also received comments specifically relating to the cost of reporting the audit trail information in real time under the Rule as proposed. One commenter believed it would cost \$1.25 million in initial costs to comply with the Rule as proposed.⁴⁸⁸ The commenter divided its \$1.25 million estimate into development costs of \$750,000 and hardware costs of \$500,000 (including hardware, circuits, etc.).⁴⁸⁹ In addition, this commenter believed the development timeframe would be 9–12 months “once final architecture is drafted,” and would require approximately 6,000 hours of development work.⁴⁹⁰ Notably, this commenter said that “[t]he assumptions that drove this analysis were that any real time reporting of order events would leverage the capabilities

⁴⁸² *Id.* at p. 3.

⁴⁸³ See Nasdaq Letter II, p. 2.

⁴⁸⁴ See FINRA/NYSE Euronext Letter, p. 6. This commenter stated that “[a]n alternative to the all-encompassing real time order audit trail set forth in the Proposal would be to standardize and consolidate existing real time reporting systems (e.g., enhancing trade reporting and quotation systems with standardized and uniform identification for all broker-dealers) and enhance existing reporting requirements where the need is narrowly focused.” See also FINRA Proposal Letter, p. 3–4, 10–11.

⁴⁸⁵ See FIF Letter, p. 4; Ross Letter, p. 1.

⁴⁸⁶ See FIF Letter, p. 4.

⁴⁸⁷ See Ross Letter, p. 1.

⁴⁸⁸ See Ameritrade Letter, p. 2.

⁴⁸⁹ *Id.*

⁴⁹⁰ *Id.*

contained within the [OATS] reporting today and that the revised real time system would retire the legacy systems of Bluesheets, OATS, OTS and TRACE.”⁴⁹¹ With respect to ongoing costs to provide information, this commenter also stated that it believed the Commission had underestimated the ongoing costs of the proposal.⁴⁹² However, another commenter, who opined that the goals of the consolidated audit trail could be achieved for significantly lower costs than the Commission originally estimated, stated that, if the Rule permitted market participants to modify existing systems for collecting and reporting audit trail information, the consolidated audit trail objectives could “be achieved and perhaps even surpassed.”⁴⁹³

iii. Adopted Rule 613(c)(3)

As described in detail below, the Commission is adopting Rule 613 with two significant modifications to the proposed requirement that the NMS plan submitted to the Commission for its consideration require the collection and provision of key audit trail data to the central repository on a “real time” basis. First, the Rule, as adopted, no longer requires the real-time reporting of consolidated audit trail data but, instead, provides that order event audit trail data must be reported “by 8:00 a.m. Eastern Time on the trading day following the day such information has been recorded by the national securities exchange, national securities association or member.”⁴⁹⁴ Second, the adopted Rule clarifies that this data is to be recorded “contemporaneously with the reportable event,” instead of in “real time.”⁴⁹⁵

(A) Reporting of Audit Trail Data by 8:00 a.m. Eastern Time on the Trading Day Following the Day Such Information Has Been Recorded

The Commission has considered the commenters’ concerns regarding a “real-time” reporting requirement for audit trail data, including its achievability and cost effectiveness; the accuracy of audit trail data recorded and reported in real time; and the necessity, merits, and usefulness of real-time audit trail data.⁴⁹⁶

⁴⁹¹ *Id.*

⁴⁹² *Id.*

⁴⁹³ See Thomson Reuters Letter, p. 2.

⁴⁹⁴ See Rule 613(c)(3). The Rule further provides that the NMS plan “may accommodate voluntary reporting prior to 8:00 a.m. Eastern Time, but shall not impose an earlier reporting deadline on the reporting parties.” *Id.*

⁴⁹⁵ *Id.*

⁴⁹⁶ See Scottrade Letter, p. 1–2; Angel Letter, p. 3; ICI Letter, p. 3–6; FINRA/NYSE Euronext Letter,

Continued

On the one hand, the Commission recognizes that there may be very considerable costs imposed on the industry if audit trail data was required to be reported to the central repository in real time—indeed, the Commission, in the Proposing Release, estimated the costs of creating a real-time consolidated audit trail by assuming that such a requirement would necessitate the wholesale creation of new industry-wide systems. On the other hand, the Commission also received a variety of comments suggesting that real-time reporting could be achieved in a cost-effective manner.⁴⁹⁷ And yet other commenters suggested a hybrid approach. For example, SIFMA commented that, although it believed real-time reporting as originally proposed by the Commission would be too costly, intraday reporting of a subset of audit data delayed 10–15 minutes would be possible. SIFMA further described how such reporting might be accomplished through the use of “drop-copy” data.⁴⁹⁸

With respect to concerns about the accuracy of consolidated audit trail data if real-time reporting were required, the Commission recognizes that the real-time reporting of data could result in accuracy issues to the extent SROs and broker-dealers would need to re-enter the required audit trail data into a separately prepared regulatory report containing the required audit trail data for submission to the central repository, as is the case today with OATS reports.⁴⁹⁹ The Commission notes, however, that the use of certain existing technologies, such as “drop copies” described by SIFMA, could provide reliable and accurate audit trail data to the central repository because such “drop copies” would reflect the information captured by an SRO or member’s order management and execution systems to enter, route, modify, and execute or cancel orders.

The Commission believes that, whether or not real-time reporting of data is required, the creation, implementation, and maintenance of a

consolidated audit trail will likely be a complex and significant undertaking for the industry. It therefore recognizes the practical advantages of a more incremental, or more gradual, approach to such an undertaking. After considering the many comments received on the use of real-time data by regulators, the Commission has recognized that, although there might be some additional benefits to receiving data and monitoring the markets intraday (such as for certain enforcement investigations and the facilitation of real-time cross-market surveillance), the majority of the regulatory benefits gained from the creation of an industry-wide consolidated audit trail, as described in the Proposing Release, do not require real-time reporting. Indeed, the extent of the potential uses of a consolidated audit trail discussed in Section II.A.2., *supra*, which do not rely on a real-time reporting requirement, illustrate the value of a consolidated audit trail even if data is not reported in real-time. Instead, the Rule, as adopted, provides that the NMS plan must require that order event data be reported “by 8:00 a.m. Eastern Time of the trading day following the day such information has been recorded by the national securities exchange, national securities association or member.”⁵⁰⁰

The Commission notes that, while the Rule provides that the NMS plan must impose a reporting deadline of 8:00 a.m. Eastern Time of the trading day following the day such information has been recorded by the national securities exchange, national securities association or member, the Rule also provides that the NMS plan may accommodate SROs and members that voluntarily satisfy their reporting obligations earlier.⁵⁰¹

The Commission acknowledges that, by replacing the requirement that the SROs develop a plan for real-time reporting with a requirement for reporting by 8:00 a.m. the next trading day, the Commission has precluded the possibility that, as some commenters suggested, a mandatory real-time reporting NMS plan might be developed by the SROs for consideration by the Commission and the public.⁵⁰² However, given the overall scope and complexity of creating a consolidated audit trail, the Commission has

determined that it would be more beneficial to have the SROs and their members focus on those key aspects of a consolidated audit trail that the Commission believes would be the most useful for improving regulatory oversight and monitoring (including, but not limited to, the use of unique customer identifiers, the ability to accurately link an order across its lifecycle, the inclusion of market making quotes, and the addition of options data), rather than focus on how to develop an NMS plan for real-time reporting that may not yield benefits that are equally as useful.⁵⁰³ The Commission also believes that, as a consequence of this modification, the Rule, as adopted with the 8:00 a.m. reporting deadline, will more readily accommodate a consolidated audit trail that could build upon existing audit trail infrastructures. Meeting the requirement of the Rule may no longer necessitate the creation of completely new infrastructures. In particular, the Commission notes that the OATS technical specifications require OATS data to be reported by 8:00 a.m. the following calendar day.⁵⁰⁴ Thus, the Rule, as adopted, would permit the SROs to submit an NMS plan to the Commission for its consideration with reporting timeframes comparable to OATS’ requirement, with which all FINRA members are presently capable of complying.⁵⁰⁵ As a result, broker-dealers might need to make fewer systems changes to comply with the

⁵⁰³ The Commission notes that, consistent with adopting an incremental approach to the creation of a consolidated audit trail, even though it is not requiring audit-trail data to be reported in real time, it is adding various additional requirements, discussed in Section III.C.2.a., *infra*, to the Rule regarding the evolution of the consolidated audit trail, including the possibility for reduced reporting times in the future as technologies evolve.

⁵⁰⁴ The current OATS technical specifications require OATS reporting by 8:00 a.m. on the calendar day after the reportable event. The Commission notes that the FINRA rules for OATS reporting, however, require that data “shall be transmitted on the day such event occurred”—unless information required by FINRA Rule 7440(b), (c), or (d) (order receipt and origination; order transmittal; order modifications, cancellations, and executions) is unavailable—in such cases, OATS requires reporting on the day the information becomes available. See FINRA Rule 7450(b)(2). Because of the discrepancy between the technical specifications and the applicable FINRA rule, the Commission approved FINRA’s proposed rule change to allow OATS reporting as late as 8:00 a.m. the next day. See Securities Exchange Act Release No. 66021 (December 21, 2011), 76 FR 81551 (December 28, 2011).

⁵⁰⁵ The Commission notes that the Rule, as adopted, provides that an NMS plan must require information to be reported by 8:00 a.m. the following trading day, while OATS requires information to be reported by 8:00 a.m. the following calendar day. Thus, the Rule as adopted provides for a longer reporting period than does OATS with respect to weekends and holidays.

p. 4, 6; GETCO Letter, p. 2; BATS Letter, p. 1–2; SIFMA Letter, p. 3–8; CBOE Letter, p. 4–5; Direct Edge Letter, p. 3; FINRA Letter, p. 10–13; Wells Fargo Letter, p. 3; Knight Letter, p. 2–3; Leuchtkafer Letter; Broadridge Letter, p. 3; FIF Letter, p. 4; SIFMA Drop Copy Letter, p. 1; Ross Letter, p. 1; FINRA Proposal Letter, p. 3; Nasdaq Letter II, p. 3–4; FIA Letter, p. 1–2.

⁴⁹⁷ See Thomson Reuters Letter, p. 3; Aditit Letter, p. 2; FTEN Letter p. 3; Ameritrade Letter, p. 1 (stating that the scalability of its systems could support real-time reporting); Nasdaq Letter II, p. 3 (stating that a platform supported by FTEN and SMARTS technology would support the real-time provision of data).

⁴⁹⁸ See SIFMA Drop Copy Letter.

⁴⁹⁹ See Section II.A.1.c., *supra*.

⁵⁰⁰ See Rule 613(c)(3). The Commission notes that Rule 613, as proposed, was inconsistent in its use of the terms “provide” and “report.” To eliminate this inconsistency, the Commission is replacing all uses of “provide” with “report,” which the Commission believes more accurately describes the requirement the Commission is imposing on national securities exchanges, national securities associations, and members.

⁵⁰¹ See note 494, *supra*.

⁵⁰² See note 453, *supra*, and accompanying text.

Rule than they would have had to make if real-time reporting were required, though, as discussed in Section II.C.4., *supra*, OATS in its present form would still need to be modified to meet certain of the other requirements of this Rule.⁵⁰⁶ Nevertheless, as suggested by many commenters, fewer systems changes to comply with the Rule should lead to lower costs incurred by broker-dealers.⁵⁰⁷

An additional consequence of the Commission's decision not to require real-time reporting is that, since meeting the requirements of the Rule may no longer necessitate the wholesale creation of new systems, the Commission's proposed cost estimates, which were based on this assumption, may no longer be applicable. As discussed in Section II.C.2., *supra*, the Commission believes that given the many different ways in which the SROs may develop an NMS plan that meets an 8:00 a.m. reporting requirement, the costs of such reporting will be highly dependent on the details of the specific plan proposed. The Rule, as adopted, therefore directs the SROs to provide these details, along with associated costs, in the NMS plan submitted to the Commission for the Commission and the public to consider. The Commission will be able to consider this information when determining whether to approve the NMS plan submitted.

(B) Recording of Audit Trail Data Contemporaneously With the Reportable Event

As noted above, the Rule as proposed would have required SROs and their members to "collect" audit trail data "on a real time basis." In response to commenters who commented on the meaning of "real time," the Commission is adopting this provision with modifications from the proposed Rule. Specifically, Rule 613(c)(3), as adopted, requires that "[t]he national market system plan submitted pursuant to this section shall require each national securities exchange, national securities association, and member to record the information required by paragraphs (c)(7)(i) through (v) of this section

contemporaneously with the reportable event."

The Commission believes that the term "contemporaneously" better reflects its intent, as noted in the Proposing Release, that information should be collected immediately and with no built-in delay from when the reportable event occurs. While, in response to commenters, the Commission is no longer requiring the real-time reporting of information, the Commission believes it is important for SROs and broker-dealers to "record" the events contemporaneously. The Commission expects that compliance with this requirement will not be difficult for SROs and broker-dealers with automated systems, which will contain much, if not all, of the data to be reported to the central repository as a result of processing and saving a record of any actions taken by the SRO or broker-dealer. On the other hand, broker-dealers that do not use automated systems will have to ensure that reportable events are manually recorded as they are occurring. In addition, the adopted Rule uses the term "record" in Rule 613(c)(3), instead of the proposed term "collect," because the Commission believes that term more accurately reflects its intent that a contemporaneous record be made when an order event occurs.

f. More Flexible Format for Reporting Consolidated Audit Trail Data to the Central Repository

In the Proposing Release, the Commission expressed its preliminary view that data would need to be collected and provided by SROs and their members to the central repository in a uniform electronic format to assure regulators that they will have ready access to comparable cross-market data.⁵⁰⁸ Specifically, Rule 613(c)(2), as proposed, provided that "[t]he national market system plan submitted pursuant to this section shall require each national securities exchange, national securities association, and member to collect and provide to the central repository the information required by paragraph (c)(7) of this section in a uniform electronic format."

However, the Commission received comments suggesting that audit trail data does not necessarily need to be provided by SROs and their members to the central repository in a uniform electronic format, and that such data instead could be converted automatically into a uniform format by the central repository or a third party using existing technology, which could

result in lower cost for the securities industry than originally estimated.⁵⁰⁹ Specifically, two commenters indicated that technology exists today to convert or "normalize" data that may be produced from disparate systems into a uniform format and that, as a result, implementation of the consolidated audit trail could be simpler and less costly than originally contemplated by the Commission.⁵¹⁰ One of these commenters stated that a number of risk management services and surveillance systems currently receive automatically-generated copies, or "drop copies," of order and execution messages, in real time, from a variety of broker-dealers and exchanges, and convert that information into a common standard format.⁵¹¹ Two other commenters suggested that firms that currently use FIX should be allowed to continue utilizing FIX,⁵¹² stating that FIX's prevalence in the financial industry would make it cheaper and easier to use FIX as the protocol of the consolidated audit trail.⁵¹³ Another commenter stated it could collect information directly from exchanges and other sources of information to minimize reporting obligations, and could leverage its own technology to get information directly from exchanges.⁵¹⁴

In response to these comments, the Commission has modified this aspect of the proposed Rule. Specifically, adopted Rule 613(c)(2) allows the NMS plan to provide that SROs and their members can report data either "in a uniform electronic format" or "in a manner that would allow the central repository to convert the data to a uniform electronic format, for consolidation and storage."⁵¹⁵ In light of the comments that data from multiple sources could be converted into a uniform format,⁵¹⁶ this modification provides SROs with the flexibility, in devising the NMS plan, to better accommodate a range of proposals, including those based on leveraging technology in a cost-effective manner by permitting data to be converted to a uniform electronic format at the broker-dealer level or at the central repository. The Commission does not believe this change will reduce the accuracy or accessibility of the audit trail data provided to regulators (since

⁵⁰⁶ As noted in the Proposing Release, *supra* note 4, at 32592, broker-dealers that rely mostly on their own internal order routing and execution management systems would have needed to make changes to or replace those systems to collect and report the required order and reportable event information to the central repository to comply with the proposed Rule.

⁵⁰⁷ See e.g., BATS Letter, p. 2; CBOE Letter, p. 2-3; Wells Fargo Letter, p. 2; Knight Letter, p. 3; High Speed, p. 1; FTEN Letter p. 1; Correlix Letter, p. 2; Thomson Reuters Letter, p. 2; FINRA Proposal Letter, p. 16; FINRA/NYSE Euronext Letter, p. 7.

⁵⁰⁸ See Proposing Release, *supra* note 4, at 32572.

⁵⁰⁹ See FTEN Letter, p. 3-4, 13-15; Thomson Reuters Letter, p. 2-3.

⁵¹⁰ *Id.*

⁵¹¹ See FTEN Letter, p. 4, 12, 14. See also SIFMA Drop Copy Letter.

⁵¹² See FIX Letter, p. 1; Aditax Letter, p. 2.

⁵¹³ *Id.*

⁵¹⁴ See Nasdaq Letter II, p. 3.

⁵¹⁵ See Rule 613(c)(2).

⁵¹⁶ See FTEN Letter, p. 3-4, 13; Thomson Reuters Letter, p. 2-3. See also SIFMA Drop Copy Letter.

the Rule still requires data to ultimately be provided to regulators in a uniform electronic format).

Further, by providing the SROs the ability to use a number of approaches to normalization, broker-dealers and SROs may not need to make substantial changes to their order management and execution systems to comply with Rule 613; instead, the central repository or the broker-dealers could convert such data into a uniform electronic format, and the Rule now provides the plan sponsors with the flexibility to use this approach in the NMS plan submitted to the Commission for its consideration. The Commission believes that, to the extent it avoids requiring broker-dealers and SROs to make substantial changes to their order management and execution systems to comply with Rule 613 regarding a uniform electronic format, this type of approach could be a more efficient and cost-effective method for collecting the specified audit trail data required by the Rule.⁵¹⁷ The Commission expects that the NMS plan submitted for its consideration will specify how any normalization approach that might be included in the plan will lead to accurate and reliable data.⁵¹⁸

g. Timeframe for Reporting Other Data Elements to the Central Repository

i. Proposed Rule 613(c)(4)

While most order and execution information would have been required to be reported to the central repository on a real-time basis under the proposed Rule, the Commission also recognized that not all information required to be reported to the consolidated audit trail would be available to the SROs and their members in real time.⁵¹⁹ In general, the audit trail data required under this timeframe reflected information not typically available until later in the order handling and execution process. This information that would have been provided on an extended timeframe included: (1) The

⁵¹⁷ The Commission believes that, if the NMS plan does not require data to be reported to the central repository in a uniform format, broker-dealers and SROs may not have to make substantial changes to their order management and execution systems to comply with Rule 613, and thus may face lower costs than if data were required to be reported in a uniform format because in that instance, broker-dealers may need to make substantial changes to their order management and execution systems to comply with Rule 613. The Commission acknowledges, however, that there would be costs to convert data to a "uniform electronic format for consolidation and storage." On balance, however, the Commission preliminarily believes that broker-dealers might benefit from economies of scale when normalizing data.

⁵¹⁸ See Rule 613(a)(1)(iii).

⁵¹⁹ See Proposing Release, *supra* note 4, at 32578.

account number for any subaccounts to which the execution is allocated (in whole or part); (2) the unique identifier of the clearing broker or prime broker (if applicable); (3) the unique order identifier of any contra-side order(s); (4) special settlement terms (if applicable); (5) the short sale borrow information and identifier; (6) the amount of a commission, if any, paid by the customer and the unique identifier of the broker-dealer(s) to whom the commission is paid; and (7) the cancelled trade indicator (if applicable) (collectively, "supplemental audit trail data").⁵²⁰ Proposed Rule 613(c)(4) would have permitted the supplemental audit trail data to be reported to the central repository promptly after the national securities exchange, national securities association, or member received the information, but in no instance later than midnight of the day that the reportable event occurs or the SRO or member receives such information.

The Commission solicited comments on proposed Rule 613(c)(4) and its requirement that certain audit trail information not available in real time be reported promptly after the national securities exchange, national securities association, or member received the information, but in no instance later than midnight of the day that the reportable event occurs or the SRO or member receives such information. One commenter believed that the timeframe for reporting the specific consolidated audit trail data listed above should be lengthened to T+1 or later.⁵²¹ This commenter was concerned that requiring broker-dealers to report certain data elements by midnight could disrupt the trading of certain products.

ii. Adopted Rule 613(c)(4)

After considering the commenter's views on proposed Rule 613(c)(4), the Commission is adopting the Rule with three modifications from the proposed Rule. First, to parallel the 8:00 a.m. deadline by which order event data must be reported to the central repository under adopted Rule 613(c)(3), adopted Rule 613(c)(4) requires that the NMS plan provide that supplemental audit trail data be reported by 8:00 a.m. Eastern Time on the trading day following the day the member receives the audit trail data, and provides that the plan may accommodate voluntary reporting prior to 8:00 a.m. Eastern Time, but shall not impose an earlier

⁵²⁰ See proposed Rule 613(c)(4), 613(c)(7)(vi) through (vii).

⁵²¹ See SIFMA Letter, p. 8; SIFMA Drop Copy Letter, p. 1.

reporting deadline on the reporting parties.

Second, the adopted Rule no longer requires the reporting of (1) special settlement terms, (2) the amount of commission, if any, paid by the customer, and the unique identifier of the broker-dealer to whom the commission is paid, and (3) the short sale borrow information and identifier. Third, adopted Rule 613(c)(4) requires that the NMS plan provide for the reporting of certain customer identification and customer account information by 8:00 a.m. Eastern Time on the trading day following the day the member receives such data, instead of in "real time," as proposed.⁵²² These modifications are discussed in more detail below.

(A) Reporting Timeframe

In response to the comments regarding the timing for reporting of consolidated audit trail data elements,⁵²³ the Commission is adopting Rule 613(c)(4) with modifications to the timeframe for reporting supplemental audit trail data. Specifically, the Rule no longer requires that supplemental audit trail data be reported "promptly" after the broker-dealer receives the information but no later than midnight of the day that the reportable event occurred; rather, adopted Rule 613(c)(4) requires the NMS plan to provide that supplemental audit trail data be reported by 8:00 a.m. Eastern Time on the trading day following the day the broker-dealer receives such information. Although the NMS plan may permit broker-dealers to report such information prior to that time, it may not require such earlier reporting. The Commission believes it is appropriate that there be an extended timeframe for reporting this data because this information (e.g., allocation to subaccounts) might not be available until later in the order handling and execution process and, on balance, the Commission does not believe it is necessary that it be reported to the central repository "promptly". Instead, the modification to Rule 613(c)(4), as proposed, now requires that the NMS plan provide that the supplemental audit trail data be reported by 8:00 a.m. Eastern Time following the day the member receives the information, which parallels the adopted Rule 613(c)(3) timeframe for reporting event data. The Commission believes this more flexible standard should reduce implementation burdens and simplify the requirements of adopted Rule 613, without materially

⁵²² See Rule 613(c)(7)(viii).

⁵²³ See Section III.B.1.g.i., *supra*.

reducing the utility of the consolidated audit trail.

The Commission notes that it has made a clarifying change to Rule 613(c)(4), as proposed, to specify that the obligation to report the supplemental audit trail data to the central repository only falls on a broker-dealer, and not on a national securities exchange or national securities association.⁵²⁴ The Commission believes that this change is appropriate because only broker-dealers receive the types of audit trail data described in Rule 613(c)(vi) through (viii).⁵²⁵

(B) Elimination of Certain Data Elements

As previously noted, proposed Rule 613(c)(4) would have required that the following information be reported to the central repository: (1) The account number for any subaccounts to which the execution is allocated (in whole or part); (2) the unique identifier of the clearing broker or prime broker (if applicable); (3) the unique identifier of any contra-side order(s); (4) special settlement terms (if applicable); (5) the short sale borrow information and identifier; (6) the amount of a commission, if any, paid by the customer and the unique identifier of the broker-dealer(s) to whom the commission is paid; and (7) cancelled trade indicator (if applicable).⁵²⁶

After considering general comments suggesting that the Commission reduce the proposed reporting obligations under Rule 613, the Commission is not requiring the following data elements to be reported to the central repository: (1) Special settlement terms; (2) the amount of commission, if any, paid by the customer; (3) the unique identifier of the broker-dealer to whom the commission is paid; and (4) the short sale borrow information and identifier.⁵²⁷ While this data may be useful in the context of certain investigations or market analyses, upon further consideration, the Commission believes that these data elements should not be required by Rule 613 because the Commission does not typically find that these particular audit

trail data elements provide enough information relevant to an initial assessment of whether illegal or manipulative activity is occurring in the marketplace to warrant that they be required as a standard part of the audit trail created by Rule 613. If the Commission or the SROs find that such information would be useful to their regulatory responsibilities, they may request the information directly from the broker-dealer with the obligation to record this information, although requests related to short sale borrow information may pose unique challenges. In effect, the Commission believes that the benefit of having these specific audit trail data elements in the consolidated audit trail at this time is unlikely to justify the recording and reporting burden on broker-dealers of providing these elements, particularly in light of the other information required to be reported under Rule 613 and the regulators' ability to obtain this information through a follow-up request. The Commission notes that, if the SROs believe that having such data elements as part of the consolidated audit trail could be useful to their regulatory responsibilities, the SROs could determine to require SROs and their members to record and report such data as part of the NMS plan.

With respect to the account number for any subaccounts to which the execution is allocated (in whole or in part)—an audit trail data element that will be required by Rule 613(c)(4), as adopted—the Commission notes that obtaining allocation information is important because part of the goal of Rule 613 is to obtain audit trail information for the life of an order, which would include how an order was ultimately allocated (*i.e.*, to which specific customer and account). The Commission notes, however, that the Rule requires the NMS plan to require a broker-dealer to report only the account number of any subaccounts to which an execution is allocated that is contained in its own books and records for accounts and subaccounts it holds; there is no obligation for the broker-dealer to obtain any additional information about accounts or subaccounts from other broker-dealers or non-broker-dealers who submitted the original order. The Commission further notes that broker-dealers will remain subject to existing regulatory requirements, including recordkeeping and suitability requirements (*e.g.*, “know your customer” rules). Including the account number of any subaccounts to which an execution is allocated in the consolidated audit trail will allow

regulators to understand how an allocation of the securities was made among customers of a broker-dealer to, for example, determine if the broker-dealer was favoring a particular customer, to better understand the economic interests of the customer, or as it relates to possible enforcement actions. Similarly, having information regarding the identity of the clearing broker or prime broker for the transaction, the identity of any contra-side order(s), and a cancelled trade indicator by 8:00 a.m. Eastern Time on the trading day following the day that the member receives such information will aid the Commission and the SROs in knowing all of the parties that touched an order (including the clearing broker, prime broker, and contra-side party to the order), and whether the order was cancelled. The Commission believes that all of this information will facilitate regulatory improvements as discussed above in Section II.A.2.

(C) Movement of Certain Data Elements From Event Data to Supplemental Audit Trail Data

As proposed, Rule 613 would have required that, in addition to the Customer-ID, customer account information and other specified information sufficient to identify a customer be reported in real time.⁵²⁸ The Commission requested comment about the feasibility of this requirement. Several commenters expressed concern over the proposed requirement that customer information be reported in real time upon origination or receipt of an order.⁵²⁹ One commenter believed that leakage of customer information could “negatively impact investor willingness to trade in the U.S. markets,”⁵³⁰ and, instead, urged regulators to rely on EBS to provide customer information.⁵³¹ Another commenter did not think it was feasible to provide customer information in real time.⁵³² Another commenter suggested that the Commission “pare down its list of data points to focus on what would appear

⁵²⁸ See Proposing Release, *supra* note 4, at 32573; proposed Rule 613(c)(7)(i)(A), (C).

⁵²⁹ See Liquidnet Letter, p. 3; Direct Edge Letter, p. 4 (emphasizing that it would be more important for exchanges to obtain the identity of the brokers on both sides of an execution for cross-market surveillance purposes); SIFMA Letter, p. 6, 9; Ameritrade Letter, p. 3.

⁵³⁰ See FIF Letter, p. 2–3.

⁵³¹ This commenter suggested an alternative if the Commission believed customer information was necessary, using both EBS and OATS: EBS could send the central repository customer account information (including account number), and OATS would add a field for the account number to link the OATS reports and customer information together. *Id.* at p. 2–3.

⁵³² See SIFMA Letter, p. 6, 9.

⁵²⁴ Rule 613(c)(4) now requires that “each member of a national securities exchange or national securities association” provide the information set forth in the Rule; as proposed, Rule 613(c)(4) required “each national securities exchange, national securities association, and member” to provide the information set forth in the Rule.

⁵²⁵ The Commission has also amended Rule 613(c)(4), as proposed, to include the provision of information sufficient to identify the customer and customer account information. See Rule 613(c)(7)(viii); Section III.B.1.g.ii.(C), *supra*.

⁵²⁶ See proposed Rule 613(c)(4), 613(c)(7)(vi), 613(c)(7)(vii).

⁵²⁷ See proposed Rules 613(c)(7)(vi)(D), 613(c)(7)(vi)(E), and 613(c)(7)(vi)(F).

on a trade ticket and certain client demographic information.”⁵³³ This commenter explained that its suggested approach “makes sense because for most brokers pulling trade ticket information from frontend systems will be straightforward, and client demographics should be easily pulled and populated onto a system for easy retrieval.”⁵³⁴ Another commenter was of the view that only customer information regarding the person exercising investment discretion for the account originating the order, such as an investment adviser, should be required to be reported.⁵³⁵ This commenter explained that if a trade is not executed an investment adviser would not typically provide information about the owners of the underlying accounts to the broker-dealer and thus this commenter suggested that it would be more practical to disclose underlying account information in relation to executed trades.⁵³⁶ Another commenter suggested that there be a “requirements analysis” that considers the availability of order and trade data, and noted that allocation data is not available at the time of order entry.⁵³⁷

In recognition of commenters’ concerns that this information may not be available in real time⁵³⁸ and to reduce the reporting burdens on broker-dealers, the Commission is moving data elements, including the customer’s name, address, and account information, and large trader identifier (if applicable) (collectively defined as “customer attributes”) from the order event data category to the supplemental audit trail data category.⁵³⁹ As a result, the Commission is adopting the Rule to provide that the NMS plan require that customer attributes⁵⁴⁰ including the customer’s name, address,⁵⁴¹ and customer account information be reported under Rule 613⁵⁴² no later than

8:00 a.m. Eastern Time on the trading day following the day that the member receives the information.⁵⁴³ The Commission expects that the Customer-ID will be able to be linked to the customer attributes in the consolidated audit trail.

The Commission believes that, to realize many of the objectives of a consolidated audit trail, the specific attributes of a customer must be recorded and, when needed, made available to regulators. Without these customer attributes, the data recorded is effectively anonymized, which would prevent regulators from using the enhanced consolidated audit trail data to take any enforcement action against specific individuals. The Commission believes customer attributes⁵⁴⁴ are necessary because regulatory authorities need to accurately and efficiently identify the customer to effectively surveil and analyze the markets, and enforce the securities laws. For example, as noted in the Proposing Release,⁵⁴⁵ a trader may trade through multiple accounts at multiple broker-dealers. Being able to identify the account holder aids in the identification and investigation of suspicious trading activity. Accordingly, the unique customer identifier that is required to be reported to the central repository for original receipt, origination, modification, or cancellation of an order,⁵⁴⁶ and that links together all reportable events by the same customer, must ultimately link back to information regulators could use to identify the party. With this information, regulators could more quickly initiate investigations, and more promptly take appropriate enforcement action. While this information could be requested from broker-dealers by the Commission and the SROs on a case-by-case basis, the Commission believes that achieving these benefits requires having such information maintained in a uniform format that is readily accessible to the Commission and the SROs.

Furthermore, in response to the commenters concerns with respect to the confidentiality of this sensitive information,⁵⁴⁷ and as discussed in more detail below, the adopted Rule includes requirements for enhanced safeguards with respect to the privacy

and confidentiality of consolidated audit trail data, including customer information.⁵⁴⁸

In response to the commenter who suggested only information appearing on the trade ticket and certain client demographic information⁵⁴⁹ be collected, the Commission notes that it may be feasible for the NMS plan to allow customer identifying and account information to be reported by a broker-dealer to the central repository only when the customer opens or closes an account (or at the time the consolidated audit trail is first implemented for pre-existing accounts)—this information may not need to be re-reported with every order.⁵⁵⁰ Under this approach, the specified customer attributes may be stored in the central repository and automatically linked to an order whenever an order with the applicable Customer-ID is reported. As the Commission noted in the Proposing Release,⁵⁵¹ broker-dealers today, as part of their books and records requirements, must take reasonable and appropriate steps to ensure the accuracy of the customer information with respect to orders received.⁵⁵² Following adoption of the Rule, and the creation and implementation of the consolidated audit trail, broker-dealers will continue to be subject to this requirement as they report customer information to the central repository. The Commission believes that allowing the specified customer attributes to be reported to the central repository by 8:00 a.m. Eastern Time on the trading day following the day that a broker-dealer first receives this information appropriately balances the regulatory need with the practical burdens of supplying it in real time as originally proposed.

In response to the commenter who stated that an investment adviser would not typically provide information about the owners of the underlying accounts to the broker-dealer if the trade is not executed,⁵⁵³ the Commission notes that, in the case of an adviser that enters an order to buy or sell securities using its own account held at the broker-dealer originating the order, the Rule, as adopted, would only require the NMS

⁵³³ See Ameritrade Letter, p. 2–3.

⁵³⁴ *Id.*

⁵³⁵ See Liquidnet Letter, p. 3.

⁵³⁶ See Liquidnet Letter, p. 3, 5–6.

⁵³⁷ See FIF Letter II, p. 2.

⁵³⁸ See SIFMA Letter, p. 6; Liquidnet Letter, p. 3.

⁵³⁹ See also Rule 613(j)(4) which defines “customer account information” to include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable).

⁵⁴⁰ Rule 613(j)(3), as adopted, defines the term “customer” to mean the account holder(s) of the account at a registered broker-dealer originating the order; and any person from whom the broker-dealer is authorized to accept trading instructions for such account, if different from the account holder(s).

⁵⁴¹ See Proposing Release, *supra* note 4, at 32573.

⁵⁴² The Commission notes that, under the Rule, a broker-dealer must only report the account number for the account the customer used to submit an order, not the account numbers for all accounts of a customer.

⁵⁴³ See Rule 613(c)(4).

⁵⁴⁴ As adopted, Rule 613(c)(7)(viii) provides that, “[f]or original receipt or origination of an order, the following information: (A) Information of sufficient detail to identify the customer; and (B) Customer account information” be recorded and reported to the central repository.

⁵⁴⁵ See Proposing Release, *supra* note 4, at 32578.

⁵⁴⁶ See Section III.B.1.d.iii., *supra*.

⁵⁴⁷ See FIF Letter, p. 3.

⁵⁴⁸ See Section III.B.3.b., *infra*.

⁵⁴⁹ See Ameritrade Letter, p. 2–3.

⁵⁵⁰ However, if any information previously reported by a broker-dealer to the central repository changes, the broker-dealer would need to report the updated information to the central repository by 8:00 a.m. Eastern Time on the trading day following the day that the broker-dealer receives the updated information.

⁵⁵¹ See Proposing Release, *supra* note 4, at 32566.

⁵⁵² See, e.g., Rules 17a–3, 17a–4, 17a–25 under the Exchange Act, 17 CFR 240.17a–3, 17a–4, 17a–25.

⁵⁵³ See Liquidnet Letter, p. 3, 5–6.

plan to require the capture of information about the owners of the underlying client accounts for which the order was placed if there is an executed trade, and if the executed trade is allocated (pursuant to Rule 613(c)(7)(vi)) to the accounts of the adviser's clients at the same broker-dealer.⁵⁵⁴ However, the Commission notes that, in the case of an adviser that enters an order on behalf of clients that each maintain separate accounts at the broker-dealer originating the order, using those accounts, the Rule would require the NMS plan to require the capture of both the adviser—as the person providing trading instructions to the broker-dealer (pursuant to Rule 613(j)(3)(ii))—and the clients, who are the account holders at the broker-dealer (pursuant to Rule 613(j)(3)(i)), even if the order did not result in execution.

Finally, in the Proposing Release,⁵⁵⁵ the Commission specifically requested comment on whether there are laws or other regulations in other jurisdictions that would limit or prohibit members from obtaining the proposed customer information for non-U.S. customers. The Commission also requested comment on how members currently obtain such information. If broker-dealers did encounter special difficulties in obtaining customer information from other jurisdictions, the Commission requested comment on how the proposed consolidated audit trail requirements should be modified to address such difficulties.

The Commission received one comment on this issue.⁵⁵⁶ The commenter expressed concern that, if broker-dealers were forced to refuse orders from non-U.S. customers because the laws of another jurisdiction prohibited disclosure of certain customer information, U.S. broker-dealers would be penalized and trading activity may shift offshore.⁵⁵⁷ The commenter recommended that the Commission adopt a limited exemption that would allow broker-dealers to accept orders from non-U.S. broker-dealers without providing customer information, in recognition of the fact that these broker-dealers are subject to regulation in their home countries.⁵⁵⁸

In the Rule, as adopted, “customer” is defined as “(i) [t]he account holder(s) of the account at a registered broker-dealer originating the order; and (ii) [a]ny person from whom the broker-dealer is

authorized to accept trading instructions for such account, if different from the account holder(s).” Under this definition, the non-U.S. broker-dealer referred to above is the “customer” of the U.S. broker-dealer for purposes of the rule. The U.S. broker-dealer would be required to record customer information for transactions in NMS securities only with respect to its foreign broker-dealer customer. There is no requirement to record information about the customers of such foreign broker-dealer. Because the Rule as adopted does not require a non-U.S. broker-dealer placing orders in NMS securities through a U.S. broker-dealer to provide information about its customers to the consolidated audit trail, the Commission believes that the requested limited exemption is unnecessary.

Although the Commission is aware that the privacy laws of some, but not all, foreign jurisdictions may hinder a foreign broker-dealer's ability to disclose personal identifying and account information of their customers absent customer authorization, the Rule as adopted does not require the foreign broker-dealer to disclose this information about its customers.⁵⁵⁹ Accordingly, a non-U.S. customer desiring to trade in the U.S. markets would be permitted to do so through a foreign broker-dealer without having to disclose its personal data to the consolidated audit trail. Because the Rule as adopted does not require a foreign broker-dealer to disclose personal identifying and account information of its customers to the consolidated audit trail, the Commission does not believe that trading in NMS securities will shift offshore as a result of the customer identification requirements.

h. Clock Synchronization

As proposed, Rules 613(d)(1) and (2) required that the NMS plan filed with the Commission include a requirement that each SRO and its members synchronize their business clocks that they use for the purposes of recording the date and time of any event that must be reported to the time maintained by the National Institute of Standards and Technology (“NIST”), consistent with industry standards.⁵⁶⁰ The SROs and their members also would have been

required to annually evaluate the clock synchronization standard to determine whether it should be changed to require finer increments, consistent with any changes to industry standards.⁵⁶¹ This clock synchronization would have been required to occur within four months after effectiveness of the NMS plan.⁵⁶²

A few commenters expressed concerns with the Commission's proposed approach to clock synchronization, and a few commenters provided comments specifically relating to the Commission's estimated costs relating to clock synchronization.⁵⁶³ One commenter preferred a synchronization standard measured in seconds and believed that synchronizing at the millisecond level would require specialized software configurations and expensive hardware.⁵⁶⁴ This commenter also was of the view that there could be material problems with systems latency if processors were required to re-synchronize clocks every few seconds to address “time drift” issues—further deviations from the time maintained by the NIST that may occur after a clock is synchronized.⁵⁶⁵ Another commenter suggested that a clock synchronization standard shorter than the three second standard currently required by FINRA for OATS compliance might be impossible to achieve across market participants.⁵⁶⁶ A third commenter was concerned that implementing clock synchronization could require firms to make modifications to a variety of related applications.⁵⁶⁷ One commenter noted that synchronizing clocks to milliseconds would require costly specialized software and hardware.⁵⁶⁸

On the other hand, one commenter—a provider of data capture and time stamping technology—noted that “[t]he advent of relatively low cost GPS receivers that derive absolute timing information accurate to better than 0.1 micro-seconds has significantly eased the problem of clock synchronization across multiple global locations,” that “[s]uch technology costs a few thousands of dollars per installation,” and that “[i]t is already in use by exchanges and high frequency

⁵⁶¹ See proposed Rule 613(d)(2).

⁵⁶² See proposed Rule 613(a)(3)(ii).

⁵⁶³ See SIFMA Letter, p. 14; FIF Letter, p. 6–7; Broadridge Letter, p. 3; Endace Letter, p. 2.

⁵⁶⁴ See FIF Letter, p. 6.

⁵⁶⁵ See FIF Letter, p. 6–7 (stating that currently “time drift” is an issue, despite advancements in synchronization technology, with at least one exchange experiencing time drifts between one and three seconds, and the SIP having its own time drift).

⁵⁶⁶ See SIFMA Letter, p. 14.

⁵⁶⁷ See Broadridge Letter, p. 3.

⁵⁶⁸ See FIF Letter, p. 7.

⁵⁵⁴ See Rule 613(j)(3); see also Section III.B.1.d.iii.(C)(2), *supra* (discussing the definition of “customer” as applied to investment advisers).

⁵⁵⁵ See Proposing Release, *supra* note 4, at 32573.

⁵⁵⁶ See SIFMA Letter, p. 21.

⁵⁵⁷ *Id.*

⁵⁵⁸ *Id.*

⁵⁵⁹ The Rule does, of course, require the NMS plan submitted to the Commission for its consideration to require the foreign broker-dealer to disclose information about itself to the U.S. broker-dealer, as such information would be expected to be part of the records of the U.S. broker-dealer holding a foreign broker-dealer account.

⁵⁶⁰ See proposed Rule 613(d)(1).

traders.”⁵⁶⁹ Another commenter expressed support generally for the Commission’s proposed approach to clock synchronization.⁵⁷⁰

After considering the comments received on this issue, the Commission is adopting Rule 613(d)(1) as proposed. As this provision requires that the NMS plan require clock synchronization consistent with industry standards, the Commission expects the NMS plan that is submitted to specify the time increment within which clock synchronization must be maintained, and the reasons the plan sponsors believe this represents the industry standard. The Commission notes that FINRA currently requires its members to synchronize their business clocks used for OATS reporting to within one second of the time maintained by NIST.⁵⁷¹ The Commission believes that the current industry standard for conducting securities business is more rigorous than one second. For example, as one commenter noted, technology used today by exchanges and high frequency trading firms synchronizes clocks to increments well within the millisecond level.⁵⁷² The Commission recognizes, as another commenter noted, that some firms may need to upgrade their technology to meet the industry standard,⁵⁷³ and that there will be attendant costs for such upgrading.⁵⁷⁴

The Commission continues to believe that it is appropriate to require members of the securities industry to synchronize their clocks to the time maintained by NIST. Effective clock synchronization is essential to maintaining an accurately time-sequenced consolidated audit trail, particularly one where time stamps will be in millisecond increments or less. Because the consolidated audit trail will capture trading activity occurring across markets, if the business clocks used by SROs and their members for the purposes of recording the date and time for reportable events are not properly and consistently synchronized, the consolidated audit trail data will not be accurately time-sequenced. It is critical

for the consolidated audit trail to allow regulators the capability to accurately determine the order in which all reportable events occur.⁵⁷⁵

The Rule as proposed required that both the SROs and their members annually evaluate the clock synchronization standard to determine whether it should be changed to require finer increments, consistent with any changes in the industry standard.⁵⁷⁶ The Commission believes that the obligation to evaluate the clock synchronization standard annually should be borne by the SROs as the plan sponsors, not SRO members. The Commission believes that it is appropriate for the SROs, as regulators of the securities markets and users of the consolidated audit trail data, to have the obligation to evaluate whether a change in the clock synchronization standard is warranted.⁵⁷⁷ Therefore, the adopted Rule provides that the NMS plan shall require SROs to evaluate annually the clock synchronization standard set forth in the NMS plan.⁵⁷⁸

The Commission recognizes, as a commenter noted,⁵⁷⁹ that time drift is an issue that must be addressed by the plan sponsors, to prevent a deterioration of the accuracy of the data in the consolidated audit trail. Therefore, the Commission expects the NMS plan to address the maximum amount of time drift that would be allowed before clocks must be re-synchronized, and why this is consistent with the industry standard.

As with many other aspects of the Rule, the costs of this requirement are highly dependent on the details of the solution proposed by the SROs because the Commission is leaving it up to the SROs to determine the maximum allowable time drift. As such, the SROs must discuss in their submitted plan the clock-synchronization standard they proposed, what alternatives were considered, and the rationale behind their choice. Once the NMS plan is received, the Commission, as well as the public, will be able to consider the extent to which the proposed synchronization standard supports the ability of regulators to fully achieve the benefits afforded by the creation of a cross-market consolidated audit trail.

⁵⁷⁵ See Section III.B.1.d.v., *supra* (explaining the importance to enforcement cases of an accurately timed record of order events).

⁵⁷⁶ See proposed Rule 613(d)(2).

⁵⁷⁷ See Rule 613(d)(2).

⁵⁷⁸ Rule 613(d)(2) provides that “[e]ach national securities exchange and national securities association [shall] evaluate annually the clock synchronization standard to determine whether it should be shortened, consistent with changes in industry standards * * *.”

⁵⁷⁹ See FIF Letter, p. 7.

2. Central Repository

a. Central Repository as a Facility of the SROs

As proposed, Rule 613(e) required that the NMS plan provide for the creation and maintenance of a central repository,⁵⁸⁰ which would have been a “facility” of each exchange and FINRA.⁵⁸¹ The central repository would have been jointly owned and operated by the exchanges and FINRA, and the NMS plan would have been required to provide, without limitation, the Commission and SROs with access to, and use of, the data reported to and consolidated by the central repository for the purpose of performing their respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations.⁵⁸² Each of the exchanges and FINRA would have been a sponsor of the plan⁵⁸³ and, as such, would have been jointly responsible for selecting a plan processor to operate the central repository.⁵⁸⁴

The Commission requested comment on the need for a central repository to receive and retain the consolidated audit trail information, whether there would be alternatives to creating a central repository for the receipt of order audit trail information, and whether it would be practical or appropriate to require the SROs to jointly own and operate the central repository.

A few commenters discussed the proposed ownership structure of the central repository.⁵⁸⁵ One commenter argued that the central repository should be owned and operated by the Commission, or a non-SRO formed specifically to operate the central repository, and expressed concern that the central repository could be used by SROs as a source of revenue through the imposition of penalties.⁵⁸⁶ Another commenter recommended that the Commission own the repository and not outsource it to a third party, explaining

⁵⁸⁰ See proposed Rule 613(e)(1).

⁵⁸¹ The term “facility” is defined in Section 3(a)(2) of the Exchange Act, with respect to an exchange, to include “its premises, tangible or intangible property whether on the premises or not, any right to use such premises or property or any service thereof for the purpose of effecting or reporting a transaction on an exchange (including, among other things, any system of communication to or from the exchange, by ticker or otherwise, maintained by or with the consent of the exchange), and any right of the exchange to the use of any property or service.” 15 U.S.C. 78c(a)(2).

⁵⁸² See proposed Rule 613(e)(2).

⁵⁸³ See proposed Rule 613(a)(4).

⁵⁸⁴ See proposed Rule 613(a)(3)(i).

⁵⁸⁵ See Ameritrade Letter, p. 4; High Speed Letter, p. 1; BATS Letter, p. 2.

⁵⁸⁶ See Ameritrade Letter, p. 4.

that, in systemically important events, it may be necessary to have immediate and direct access to the data, without an intermediary.⁵⁸⁷ Yet another commenter noted that the decision to use OATS or another system as the basis for the consolidated audit trail system should be separate from the choice of the party that will be responsible for building and operating the central repository.⁵⁸⁸

The Commission received a couple of comments specifically regarding the costs of the creation and maintenance of the central repository. FINRA, in one of its comment letters, submitted a “blueprint” for a version of a consolidated audit trail based on enhancements to OATS—though without certain key elements proposed to be required by the adopted Rule—and estimated initial costs for developing the repository to be between \$100 million and \$125 million, with ongoing annual costs to be between \$30 million and \$40 million.⁵⁸⁹ Another commenter suggested the use of cloud computing for the central repository which it believed would cost less than \$10 million per year.⁵⁹⁰

The Commission has considered the comments and is adopting as proposed the requirement in Rule 613(e)(1) that the NMS plan provide for the creation of a central repository. The Commission believes that having a central repository is important to ensuring access to consolidated data for the Commission and SROs, and for ensuring consistency, quality, and security in the audit trail data.

As adopted, Rule 613(e)(1) does not dictate a particular audit trail collection system to be used as the central repository for the consolidated audit trail, but, instead, delineates the required core features of such a system.

The Commission considered the commenter’s recommendation that it should own the central repository⁵⁹¹ but determined that such ownership is not necessary as long as the central repository has the core features articulated in the Rule, the Commission and SROs have full access to the audit trail data for regulatory purposes, and the central repository is a facility of each SRO subject to Commission oversight.⁵⁹² The Commission notes that, because the central repository will be jointly owned by, and a facility of, each SRO, it will be subject to

Commission oversight. The Commission will have unfettered access to the data in the central repository without being its owner.

The Commission also considered the comment that the central repository should be owned by a non-SRO specifically formed to operate the central repository.⁵⁹³ The Commission, however, believes that it will have more regulatory authority over the central repository as a facility of each SRO than it would have if the central repository were owned or operated by a non-SRO. First, the Commission has the statutory obligation to oversee the SROs, including facilities thereof, and to ensure that SROs enforce compliance by their members with the respective SRO’s rules, and the federal securities laws, rules, and regulations.⁵⁹⁴ Second, a facility of an SRO is subject to the rule filing requirements of Section 19(b) of the Exchange Act.⁵⁹⁵

In response to the commenter who expressed concern that the plan sponsors would use the central repository to generate revenue through penalties,⁵⁹⁶ the Commission notes that any penalty provisions must be provided in the NMS plan submitted to the Commission for its consideration, or in a future amendment to the NMS plan, if the NMS plan is approved. The Commission will review the NMS plan submitted for its consideration, which also will be subject to public notice and comment, to assure itself that the NMS plan is designed to be applied fairly and otherwise in a manner consistent with the Exchange Act. The Commission expects that the NMS plan’s penalty provisions would provide sufficient detail regarding the circumstances in which any penalties would apply, and any restrictions on how payments of such penalties may be used, to permit the Commission to determine that such penalty provisions are fair and consistent with the Exchange Act. As the central repository will be a facility of the plan sponsors, the rules governing

it must be consistent with the Exchange Act.⁵⁹⁷ In addition, future amendments to the penalty provisions would either be reviewed as an amendment to the NMS plan, under Rule 608 of Regulation NMS, or, because the central repository is a facility of the SROs, as a proposed rule change of the central repository under Section 19 of the Exchange Act.⁵⁹⁸ Additionally, the Commission has the authority to review any action taken or failure to act by any person under an effective NMS plan, pursuant to Rule 608(d)(1) of Regulation NMS.⁵⁹⁹ Lastly, any penalty provisions included in the NMS plan approved by the Commission will be subject to the Commission’s inspection and examination program of SROs to ensure they are implemented fairly in a manner consistent with the Exchange Act.⁶⁰⁰

In response to the comments regarding the costs of the creation and maintenance of a central repository, the Commission notes that the costs would be highly dependent on the decisions the SROs make with respect to each of the areas in which the Commission has provided flexibility to the SROs in crafting the NMS plan to be submitted to the Commission for its consideration. For example, cost estimates could vary depending on whether the NMS plan requires unique order identifiers or permits “a series of order identifiers.” Such cost estimates also could vary because the Rule does not specify details regarding, among other things, the security and confidentiality procedures of the central repository, the system for assigning customer identifiers, the format(s) of data reported to the central repository, the methods by which regulators will access data in the central repository, whether an annual independent evaluation will be

⁵⁹⁷ See note 581, *supra* (describing the nature of a “facility”).

⁵⁹⁸ 15 U.S.C. 78s.

⁵⁹⁹ 17 CFR 242.608(d)(1). If the Commission does not make a finding that the action or failure to act is consistent with the provisions of the NMS plan and was applied in a manner consistent with the Act, or if it finds that such action or failure to act imposes any burden on competition not necessary or appropriate in furtherance of the purposes of the Act, the Commission, by order, can set aside such action and/or require such action with respect to the matter reviewed as the Commission deems necessary or appropriate in the public interest, for the protection of investors, and the maintenance of fair and orderly markets, or to remove impediments to, and perfect the mechanisms of, the NMS plan. 17 CFR 242.608(d)(3).

⁶⁰⁰ The Commission notes that, as part of its inspection and examination program, its staff has the authority to examine the application of any penalty provisions in the NMS plan to determine whether they have been applied fairly. In this manner, the Commission will be able to monitor how the plan sponsors have applied any penalty provisions set out in the NMS plan approved by the Commission.

⁵⁸⁷ See High Speed Letter, p. 1.

⁵⁸⁸ See BATS Letter, p. 2.

⁵⁸⁹ See FINRA Proposal Letter, p. 14–16.

⁵⁹⁰ See High Speed Letter, p. 1.

⁵⁹¹ See Ameritrade Letter, p. 4.

⁵⁹² See note 581, *supra* (describing the nature of a “facility”).

⁵⁹³ See Ameritrade Letter, p. 4.

⁵⁹⁴ See, e.g., 15 U.S.C. 78b; 15 U.S.C. 78f(b); 15 U.S.C. 78o–3(b); 15 U.S.C. 78s(h)(1).

⁵⁹⁵ Section 19(b)(1) of the Exchange Act defines the term “proposed rule change” to mean “any proposed rule or rule change in, addition to, or deletion from the rules of [a] self-regulatory organization.” Pursuant to Section 3(a)(27) and 3(a)(28) of the Exchange Act, the term “rules of a self-regulatory organization” means (1) the constitution, articles of incorporation, bylaws and rules, or instruments corresponding to the foregoing, of an SRO, and (2) such stated policies, practices and interpretations of an SRO (other than the Municipal Securities Rulemaking Board) as the Commission, by rule, may determine to be necessary or appropriate in the public interest or for the protection of investors to be deemed to be rules.

⁵⁹⁶ See Ameritrade Letter, p. 4.

required, how reportable events related to the same order will be linked, or how errors will be processed. Such information will be known only after the filing of the NMS plan and, thus, the Commission believes it is appropriate to defer consideration of such costs until the NMS plan is submitted for its consideration. Once it is submitted, the Commission will be able to use this information in determining whether to approve the NMS plan.

The Commission notes that other provisions of the Rule that are applicable to the central repository, discussed below, have been modified from the proposal, including provisions relating to the format in which the data may be reported,⁶⁰¹ and to the security and confidentiality of the consolidated audit trail data.⁶⁰²

b. Receipt, Consolidation, and Retention of Data

1. Audit Trail Data

In addition to providing for the creation and maintenance of the central repository, Rule 613(e), as proposed, also would have required the central repository to receive, consolidate, and retain all data reported by the SROs and their members pursuant to the Rule and the NMS plan.⁶⁰³

The Commission is adopting, substantially as proposed, the provisions in Rule 613(e) regarding the responsibility of the central repository to receive, consolidate, and retain the audit trail data, but with a few modifications to reflect changes the Commission made to other sections of Rule 613.⁶⁰⁴

The first change to Rule 613(e)(1) is a conforming change to the modification in adopted Rule 613(c)(2) that permits the NMS plan to provide that audit trail data be reported to the central repository either in a uniform electronic format, or in a manner that would allow the central repository or a third party to convert the data to a uniform electronic format for consolidation and storage.⁶⁰⁵ Given the need for cross-market comparability and ready access,⁶⁰⁶ the adopted Rule requires that, to the extent the NMS plan does not require that data be reported to the central repository in a uniform electronic format, the central repository must convert the data to a uniform electronic format for

consolidation and storage.⁶⁰⁷ The Commission notes that, regardless of whether the NMS plan submitted to the Commission for its consideration elects to have the central repository normalize audit trail data reported, the Rule requires the central repository to consolidate and store the data in a uniform electronic format.

The second change to Rule 613(e)(1) reflects the Commission's view that, while it is appropriate to provide the plan sponsors with the flexibility to determine how an order will be identified, audit trail data must be stored in the central repository in a manner that will allow order information to be retrieved in a timely and accurate fashion. Accordingly, adopted Rule 613(e)(1) requires that the audit trail data consolidated in the central repository be stored "in a form in which all events pertaining to the same originating order are linked together in a manner that ensures timely and accurate retrieval * * * for all reportable order events for that order." The Commission notes that, regardless of whether the NMS plan submitted to the Commission for its consideration elects to use a series of order identifiers or a unique order identifier, the Rule requires the central repository to be able to link together all reporting events pertaining to an order.

In looking ahead to considering the overall cost of creating, implementing, and maintaining a consolidated audit trail in connection with the NMS plan, the Commission recognizes that, in addition to the costs to SRO members who would be required to record and report data to the central repository, there also will be costs associated with creating and maintaining a central repository. These costs may include: (1) The purchase and maintenance of servers and systems to receive, consolidate, and retain audit trail data, and to allow access to and searches on the data; (2) the development of policies and procedures relating to the timeliness, accuracy, completeness, security, and confidentiality of the data collected; (3) the development and maintenance of a comprehensive information security program for the central repository; and (4) dedicated staff, including a CCO.

2. NBBO Information, Transaction Reports, and Last Sale Reports

In addition to receiving, consolidating, and retaining audit trail data reported pursuant to Rule 613(c), Rule 613(e)(5), as proposed, would have required the central repository to collect

and retain, on a current and continuing basis and in a format compatible with the information collected pursuant to Rule 613(c)(7),⁶⁰⁸ the NBBO information for each NMS security,⁶⁰⁹ as well as transaction reports reported pursuant to an effective transaction reporting plan filed with the Commission pursuant to, and meeting the requirements of, Rule 601 of Regulation NMS under the Exchange Act.⁶¹⁰ In addition, last sale reports reported pursuant to the OPRA Plan filed with the Commission pursuant to, and meeting the requirements of, Rule 608 of Regulation NMS under the Exchange Act would have been required to be collected and retained.⁶¹¹

One commenter expressed its belief that, "[a]s in the case of the current OATS system, execution data provided to the consolidated audit trail should identify where the trade was publicly reported and have a common identifier that links the audit trail execution reports for the buy and sell orders to the public trade report."⁶¹² The Commission believes that the proposed requirement for the central repository to collect and retain NBBO information, as well as transaction reports and last sale reports,⁶¹³ would facilitate the ability of SRO and Commission staff to search across order, NBBO, and transaction databases. Moreover, inclusion of NBBO information would permit regulators to compare order execution information to the NBBO information readily as all of the information will be available in a compatible format in the same database. This information also would be available to the Commission to assist in its oversight efforts.

Additionally, requiring the central repository to collect and retain the NBBO and transaction information in a format compatible with the order execution information would aid in monitoring for regulatory compliance (e.g., Rule 201 of Regulation SHO). Also, this information would be useful in conducting market analyses (e.g., how order entry affects NBBO prices and depth). The Commission believes that the requirement that the central repository collect transaction reports reported pursuant to the CTA, UTP, and OPRA plans⁶¹⁴ would allow regulators to more efficiently evaluate certain

⁶⁰⁸ See Section III.B.1.d., *supra*.

⁶⁰⁹ See proposed Rule 613(e)(5)(i).

⁶¹⁰ The effective transaction reporting plans include the CTA Plan and the UTP Plan. See note 101, *supra*; proposed Rule 613(e)(5)(ii).

⁶¹¹ See proposed Rule 613(e)(5)(iii).

⁶¹² See Liquidnet Letter, p. 7. See also Section III.B.d.vii., *supra*.

⁶¹³ See proposed Rule 613(e)(5)(i) through (iii).

⁶¹⁴ See proposed Rule 613(e)(7)(i) through (iii).

⁶⁰¹ See Section III.B.2.b., *infra*; Rule 613(e)(1).

⁶⁰² See Section III.B.2.e., *infra*; Rule 613(e)(4)(i).

⁶⁰³ See proposed Rule 613(e)(1).

⁶⁰⁴ See Sections III.B.1.d. and III.B.1.f., *supra*.

⁶⁰⁵ See Rule 613(c)(2); see Section III.B.1.f., *supra*.

⁶⁰⁶ See Proposing Release, *supra* note 4, at 32564. See also Section III.B.2.d., *infra*.

⁶⁰⁷ See note 516, *supra*.

trading activity. For example, a pattern of unreported trades may cause the staff of an SRO to make further inquiry into the nature of the trading to determine whether the public is receiving accurate and timely information regarding executions and that market participants are continuing to comply with the trade reporting obligations under SRO rules. Similarly, a pattern of unreported transactions could be indicia of market abuse, including failure to obtain best execution for customer orders or possible market manipulation. The Commission believes that having the quotation and transaction information currently collected with respect to NMS securities in the same data repository—and in a compatible format—as part of the consolidated audit trail would enhance regulatory efficiency when analyzing the data.

After considering the comment on this provision,⁶¹⁵ the Commission is adopting proposed Rule 613(e)(5)(ii) and (e)(5)(iii) (renumbered as Rule 613(e)(7)(ii) and (e)(7)(iii)), as proposed, and the requirement of proposed Rule 613(e)(5)(i) (renumbered as Rule 613(e)(7)(i)) for the NMS plan to require the central repository to collect and retain NBBO information for each NMS security substantially as proposed, but is clarifying that the NBBO information must include size and quote condition.⁶¹⁶ NBBO size information is integral to determining whether best execution and order handling requirements were satisfied for a particular order because these requirements depend on the relationship between the size of the order and the displayed size at the NBBO. NBBO quote condition information is integral to determining whether or not quotes are immediately accessible. For example, quote condition information that identifies whether the quote reflecting the NBBO was automated, and therefore subject to trade-through protection, or manual⁶¹⁷ may be an important consideration in determining whether the duty of best execution was satisfied. The NBBO price, size, and quote condition is used by regulators to evaluate members for compliance with regulatory

requirements, such as the duty of best execution or Rule 611 of Regulation NMS.⁶¹⁸ The Commission acknowledges that there will be costs to the central repository to purchase and to retain NBBO information, transaction reports, and last sale reports. However, the Commission believes that the benefits associated with having such information included in the central repository justify the costs to the SROs of requiring that they include this in the NMS plan submitted to the Commission for its review.

3. Retention of Information

As proposed, Rule 613(e)(6) would have provided that the NMS plan require the central repository to retain the information collected pursuant to Rule 613(c)(7) and (e)(5) in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention for a period of not less than five years. The information would have been required to be available immediately, or, if immediate availability could not reasonably and practically be achieved, a search query would have been required to begin operating on the data not later than one hour after the search query is made.⁶¹⁹

One commenter suggested that the Commission modify the time standard for the availability of older data to a next day (or later) standard, as the need for regulators to have immediate access to the data diminishes over time. The commenter stated that a requirement that the data be made available the next day, or after another longer period of time, would be less burdensome on the consolidated audit trail system and less costly, while still meeting the needs of regulators.⁶²⁰ Another commenter believed that there could be difficulties in querying and analysis because the proposal did not specify how the data would be stored in the central repository.⁶²¹

In response to the commenters' concerns, the Commission is modifying the proposed Rule. Specifically, Rule 613(e)(8) (renumbered from proposed Rule 613(e)(6)) provides that "[t]he national market system plan submitted pursuant to this section shall require the central repository to retain the information collected pursuant to [Rules 613(c)(7) and (e)(7)] in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual

intervention for a period of not less than five years." The adopted Rule does not require, as was proposed, that the consolidated audit trail data be available immediately, or if immediate availability cannot reasonably and practically be achieved, any search query must begin operating on the data not later than one hour after the search query is made.⁶²²

The Commission believes that it is unnecessary for the Rule to require a timeframe within which consolidated audit trail data must be available or a timeframe for when a search must begin after the query is made because, as discussed below,⁶²³ the Rule, as adopted, includes a provision that requires the NMS plan to specifically address the "time and method by which the data in the central repository will be made available to regulators, in accordance with paragraph (e)(1) of this section, to perform surveillance or analyses, or for other purposes as part of their regulatory and oversight responsibilities."⁶²⁴ The Commission will consider the response to this provision contained in the NMS plan submitted by the plan sponsors to the Commission, regarding the time and method by which the data in the central repository can be accessed and used by regulators as part of their regulatory and oversight responsibilities—which would encompass queries—as it evaluates the NMS plan. The Commission believes this provision provides flexibility to the SROs to devise an access requirement that meets the needs of regulators in a cost-effective and timely manner,⁶²⁵ rather than establishing a strict deadline for all data to be accessible from the central repository.

c. Timeliness, Accuracy, Integrity, and Completeness of the Consolidated Data

As proposed, Rule 613(e)(4)(ii) would have required the NMS plan to include policies and procedures, including standards, for the plan processor to ensure the timeliness, accuracy, and completeness of the data provided to the central repository. In addition, proposed Rule 613(e)(4)(iii) would have required that the NMS plan include policies and procedures, including standards for the plan processor to reject data provided to

⁶¹⁵ See Liquidnet Letter, p. 7.

⁶¹⁶ Quote condition is a field in the CQS feed that provides information on a quote, including whether such quote is an opening quote, closing quote, news pending, slow on ask side, slow on bid side, order imbalance or non-firm quote. See CQS Output Multicast Line Interface Specification, Version 48 (October 11, 2011), Appendix G.

⁶¹⁷ Manual quotes are not eligible for automatic execution and do not have trade through protection under Rule 611 of Regulation NMS. See 17 CFR 242.600(57) for a definition of a protected bid or protected offer.

⁶¹⁸ 17 CFR 242.611.

⁶¹⁹ See proposed Rule 613(e)(6).

⁶²⁰ See Nasdaq Letter I, p. 10–11.

⁶²¹ See Ross Letter, p. 1.

⁶²² See proposed Rule 613(e)(6).

⁶²³ See Section III.C.2.a.i., *infra*.

⁶²⁴ See Rule 613(a)(1)(ii).

⁶²⁵ The Commission acknowledges there would be costs to the central repository for retaining data received or collected by the central repository pursuant to Rule 613. As discussed in Section I., *supra*, the NMS plan submitted to the Commission for its consideration will include a detailed analysis of the costs of the Rule for the Commission and the public to consider after the NMS plan has been submitted.

the central repository that does not meet these validation parameters, and for SROs and members to re-transmit corrected data. Finally, proposed Rule 613(e)(4)(iv) would have required that the NMS plan include policies and procedures, including standards, to ensure the accuracy of the consolidation by the plan processor of the data provided to the central repository.

The Commission requested comment on these proposed requirements.⁶²⁶ The Commission asked if this approach was practical to ensure the integrity of the data, and whether there were alternative methods that would achieve the same purpose that would be preferable. The Commission also requested comment on how much latency would result from a validation procedure.

The Commission received comments focusing concern on the potential for errors in the consolidated audit trail and the negative effects of errors in the consolidated audit trail.⁶²⁷ One commenter stated that the “key principles [that] best ensure that the regulatory goals of the consolidated audit trail are met in a cost efficient manner” include a system that “avoids data quality issues through data validation safeguards and a structure that reads data as close to the point of origin as possible to avoid data translation errors when data is processed through intermediary applications.”⁶²⁸ Another commenter stated that “the CAT facility would also need a mechanism to identify and correct data that was inaccurate.”⁶²⁹ Another commenter noted that, “if any other protocol [other than FIX] is used a translation is required to transform data into a different protocol. This introduces error and offers the potential for manipulation of the data. Using FIX means the SEC is looking at the original format of the data.”⁶³⁰

As a point of reference, summary data about OATS provided by FINRA to Commission staff indicates that approximately 0.25% of the intra-firm data reported daily by members contains errors.⁶³¹ Additionally, according to FINRA, when errors relating to the linkage of order reports are detected, members have no obligation to correct the errors.⁶³² As a result, approximately 1–2% of each day’s recorded events remain

unmatched (i.e., multi-firm events, such as order routing, that cannot be reconciled).⁶³³ This deficiency in the OATS process diminishes the completeness and overall usefulness of the audit trail OATS creates.

In a comment letter, FINRA discussed the challenge of obtaining accurate audit trail information if the data was required in real time, and it noted the actions it undertakes to ensure the accuracy and completeness of its audit trail data and minimize errors.⁶³⁴ FINRA stated that, “to ensure the integrity of OATS data submitted, FINRA performs over 152 separate OATS data validations on each order event, each of which can result in OATS data submissions being rejected and generating an error message.⁶³⁵ As a result, FINRA performs over 40 billion separate checks each day to ensure OATS data conforms to all applicable specifications.⁶³⁶ Members are then required by rule to repair and resubmit such data that did not meet OATS specifications.⁶³⁷ Although members’ OATS compliance rates are very high on average, almost 425,000 reports per day, on average, are rejected and must be corrected.⁶³⁸ Accordingly, to use audit trail data before such validations have been performed may result in a severely distorted picture of trading and interfere with effective oversight.”⁶³⁹

With respect to mechanisms to ensure compliance by SROs with the requirements of the plan, one commenter stated that “Commission rules should focus on the reasonable design of systems, processes and procedures to fulfill their objectives and patterns and practice of non-compliance rather than looking to any failure as a rule violation. This is particularly

important in the context of data errors or similar matters.”⁶⁴⁰

Finally, another commenter believed that “major market participants” should retain “detailed information of all network packets and trade data at both the ingress and egress of their infrastructure.”⁶⁴¹ This commenter believed that this information would not need to be forwarded to “any audit authority” but explained that such information could be used by regulators in the event a “denial of service” attack were to occur at a network level to slow market activities or hinder the flow of market information. This commenter further explained that having this information would “greatly improve confidence in the integrity of data and act as a further deterrent for fraudulent activity.”⁶⁴²

After consideration of the comments received, the Commission is adopting Rule 613(e)(4)(ii) substantially as proposed. Thus, the NMS plan must have policies and procedures, including standards, to ensure the timeliness, accuracy, and completeness of the data received. The Commission believes that audit trail data that is timely, accurate, and complete is critical to the usefulness and effectiveness of Rule 613. However, the Commission is adding the term “integrity” to the list of items that the policies and procedures adopted by the plan sponsors, as set forth in Rule 613(e)(4)(ii), must address.⁶⁴³ The addition of “integrity” is designed to help emphasize that data should not be subject to benign or malicious alteration, so that such data would be consistent and reliable at each point of transmission throughout its lifecycle (i.e., transmission from the SRO or member to the central repository, data extraction, transformation and loading at the central repository, data maintenance and management at the central repository, and data access by regulators). The Commission believes that the integrity of the audit trail data is critical to the usefulness and effectiveness of the consolidated audit trail.

The Commission also is adopting Rule 613(e)(4)(iv), renumbered as Rule 613(e)(4)(iii), as proposed, which provides that the NMS plan submitted shall include policies and procedures, including standards, to be used by the

⁶²⁶ See Proposing Release, *supra* note 4, at 32582.

⁶²⁷ See Aditit Letter, p. 2; FIF Letter, p. 4; FINRA Letter, p. 11; Nasdaq Letter I, p. 8.

⁶²⁸ See Nasdaq Letter I, p. 8.

⁶²⁹ See FIF letter, p. 4.

⁶³⁰ See Aditit Letter, p. 2.

⁶³¹ See Commission Staff Memorandum, *supra*, note 64.

⁶³² *Id.*

⁶³³ *Id.*

⁶³⁴ See FINRA Letter, p. 11.

⁶³⁵ *Id.*

⁶³⁶ *Id.*

⁶³⁷ *Id.*

⁶³⁸ *Id.*

⁶³⁹ *Id.* FINRA also noted, however, that “compliance rates for OATS steadily improved over time as members gained experience with the system. For example, when the OATS rules were first implemented, the match rate between executed orders and the related trade report submitted to an NASD transaction reporting system was only 76%. Currently, this match rate is consistently over 99%, which reflects the significant time and effort that has been expended by the industry to make their systems OATS compliant. FINRA believes that creation of a new system, rather than building off of an existing reporting infrastructure, will necessarily create a learning curve and lead to reduced compliance rates over the short-term.” *Id.* The Commission acknowledges that there could be a learning curve for compliance with the NMS plan requirements for the reporting of data. The Commission, however, expects the NMS plan to minimize such reduced compliance rates to the extent reasonably practicable.

⁶⁴⁰ See Nasdaq Letter I, p. 13.

⁶⁴¹ See Endace Letter, p. 2–3.

⁶⁴² *Id.* at p. 3.

⁶⁴³ Rule 613(e)(4)(ii) provides that the NMS plan shall include policies and procedures, including standards, to ensure the timeliness, accuracy, integrity, and completeness of the data provided to the central repository.

plan processor to ensure the accuracy of the consolidation by the plan processor of the data reported to the central repository. The Commission believes that policies and procedures, including standards, to be used to ensure accuracy of the consolidated data are important and necessary because the benefits of ensuring that data is accurately reported to the central repository would be lost if the consolidation process is not as equally robust. The regulatory benefits of a consolidated audit trail are therefore based, in part, on the timeliness, accuracy, completeness, and integrity of the data ultimately available to regulators from the central repository.

As described above in Sections III.B.1.f. and III.B.1.d.iv., the adopted Rule provides the SROs with more flexibility than the proposed Rule in developing (a) the format(s) of data to be reported to the central repository, and (b) the methods by which order identifiers will be used to link reportable events. Accordingly, the Commission expects the policies and procedures included in the NMS plan submitted to the Commission for its consideration to apply to both the transmission of audit trail data from SROs and their members to the central repository, and the consolidation and retention of that data, and other information collected pursuant to the Rule, by the central repository, including, but not limited to, any normalization or conversion of the data to a uniform electronic format, and procedures for how reportable events are accurately linked. The Commission believes that it is critical to the usefulness of the consolidated audit trail that the SROs and their members report data in a manner that is accurate and complete, and that the central repository takes any and all appropriate measures to consolidate and retain that data in the same manner. To the extent the data is not accurate or complete, the ability of SRO and Commission staff to utilize the data to accomplish the goal of the consolidated audit trail will be compromised.⁶⁴⁴

In light of the comments the Commission received that noted the concern about the potential for errors in the consolidated audit trail, as well as the impact such errors may have on the consolidated audit trail,⁶⁴⁵ the Commission is revising Rule 613(e)(4)(iii) as proposed (renumbered as Rule 613(e)(6)(i)). Specifically, Rule 613(e)(6)(i) requires the NMS plan submitted to the Commission for its

consideration to “[s]pecify a maximum error rate to be tolerated by the central repository for any data reported pursuant to Rule 613(c)(3) and (c)(4); describe the basis for selecting such maximum error rate; explain how the plan sponsors will seek to reduce the maximum error rate over time; describe how the plan will seek to ensure compliance with such maximum error rate and, in the event of noncompliance, will promptly remedy the causes thereof.”⁶⁴⁶ Rule 613(e)(6)(ii) states that the NMS plan shall “[r]equire the central repository to measure the error rate each business day and promptly take appropriate remedial action, at a minimum, if the error rate exceeds the maximum error rate specified in the plan.” Rule 613(e)(6)(iii) and (iv) provide that the NMS plan shall “[s]pecify a process for identifying and correcting errors in the data reported to the central repository pursuant to [Rule 613(c)(3) and (c)(4)], including the process for notifying the national securities exchanges, national securities associations, and members who reported erroneous data to the central repository about such errors, to help ensure that such errors are promptly corrected by the reporting entity, and for disciplining those who repeatedly report erroneous data; and * * * [s]pecify the time by which data that has been corrected will be made available to regulators.”⁶⁴⁷

As noted above, the Commission believes the availability of accurate consolidated data is a critical component of a useful and effective audit trail. Ideally, there would be no errors in the recording or reporting of any audit trail data element, and every data element of every reportable event would be accurately recorded by the SROs and their members, and then accurately reported to the central repository under Rule 613, resulting in a consolidated audit trail that reflects all actions relating to every order in the market for securities. However, because the Commission understands that, to some extent, errors in reporting audit trail data to the central repository will occur, the Commission believes it is appropriate to adopt a provision in Rule 613 that requires the NMS plan to set forth the maximum error rate to be

tolerated by the central repository in the reporting of audit trail data, as well as to specify a process for identifying and correcting such errors.⁶⁴⁸

The Commission notes that the Rule leaves to the plan sponsors the ability to determine the acceptable maximum error rate, although the Rule does require that the NMS plan must explain the basis for selecting such rate. The Rule also requires the NMS plan submitted to the Commission for its consideration to set forth how the plan sponsors will seek to reduce such maximum error rate over time, thereby increasing the accuracy of audit trail data. Further, the Rule requires the NMS plan to have in place a means to ensure compliance with the maximum error rate so that SROs and their members are incentivized to comply with the maximum error rate, and to set forth a plan for promptly remedying the causes for any noncompliance.

Since the Rule leaves many of the specific details regarding error rates and error-correction processes for the plan sponsors to determine, and because the accuracy and completeness of data ultimately received by regulators is of such significance to the effective use of a consolidated audit trail, the Commission, as well as the public, would likely consider such details very important in their overall evaluation of the submitted plan. Furthermore, given that the approval of any plan by the Commission would, in part, be based on expectations of maximum error rates, the Commission believes it is equally important for objective measures to be reported that track how well the plan is meeting such expectations. Thus, to ensure the accuracy of the audit trail data generally meets these expectations, Rule 613(e)(6)(ii) also requires that the error rate identified in the NMS plan be measured each business day and that remedial action be taken if, on any given day, the error rate exceeds the maximum error rate set forth in the NMS plan.⁶⁴⁹

The Commission also believes it is appropriate to require the SROs to formulate a process for identifying and dealing with errors, and to require that the SROs or the members reporting erroneous data be notified that an error

⁶⁴⁸ See Rule 613(e)(6).

⁶⁴⁹ The Commission recognizes that in any complex system there is always a risk of occasional unexpected errors, or errors caused by rare and unexpected events. However, the Commission believes that, by tracking error rates on a daily basis, the SROs, and the Commission would be able to observe any repeated patterns or longer-term trends that suggest more systematic problems or concerns with data collection, reporting, or consolidation processes.

⁶⁴⁴ See Section II.A., *supra*.

⁶⁴⁵ See Aditai Letter, p. 2; FIF Letter, p. 4; FINRA Letter, p. 11; Nasdaq Letter I, p. 8.

⁶⁴⁶ See Rule 613(e)(6)(i). The term “error rate” is defined in Rule 613(j)(6) to mean “[t]he percentage of reportable events collected by the central repository in which the data reported does not fully and accurately reflect the order event that occurred in the market.” The SROs should consider calculating an aggregate error rate as well as error rates for subcategories such as trade reporting and quote reporting.

⁶⁴⁷ See Rule 613(e)(6)(iii) through (iv).

in reporting has occurred.⁶⁵⁰ In addition, the Commission believes it is appropriate to require the SROs to develop a process to help ensure that errors are promptly corrected by the reporting SRO or member. The Commission understands that requirements similar to these are currently implemented by FINRA as part of their OATS process, though cross-firm errors, such as those leading to irreconcilable or unmatched routes, are not generally corrected under the OATS process.⁶⁵¹ The Commission further believes that disciplining SROs and members that repeatedly report erroneous audit trail data, as required by Rule 613(e)(6)(iii), is appropriate given the need to maintain an accurate consolidated audit trail for regulatory purposes. Finally, given that the NMS plan submitted to the Commission for its consideration is required to specify a process for correcting errors, the Commission also believes it is appropriate to require, pursuant to Rule 613(e)(6)(iv), that the NMS plan submitted to the Commission for its consideration specify the time by which data that has been corrected will be made available to regulators. In reviewing the NMS plan submitted for its consideration, the Commission will therefore be able to consider the time that uncorrected but consolidated data (which was reported to the central repository by 8:00 a.m. Eastern Time on the trading day following the day such information was recorded) would be available for use by regulators, the expected error rate of this data, and the time at which a corrected version of this data would be made available to regulators. These three parameters will help inform regulators as to the potential effectiveness of starting different types of surveillance and monitoring activities at different times.⁶⁵²

The Commission acknowledges there would be costs to the central repository associated with developing policies and procedures related to the timeliness, accuracy, integrity, and completeness of data, including, but not limited to, processes for identifying and correcting errors in the audit trail data received, and measuring the error rate on a daily basis. However, the size of these costs depends significantly on the specific details of the NMS plan submitted to the Commission for its consideration. Once the SROs submit the NMS plan to the Commission for its consideration

specifying the details, parameters, and estimated costs of such processes, as well as the maximum error rate expected under such processes, the Commission and the public will be able to consider this information when determining whether to approve the NMS plan.

d. Access to the Central Repository and Consolidated Audit Trail Data for Regulatory and Oversight Purposes

As proposed, each national securities exchange and national securities association, as well as the Commission, would have had access to the central repository for the purposes of performing its respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations.⁶⁵³ This access would have included all systems of the central repository, and the data reported to and consolidated by the central repository.⁶⁵⁴ In addition, the Commission proposed to require that the NMS plan include a provision requiring the creation and maintenance by the central repository of a method of access to the consolidated data.⁶⁵⁵ This method of access would have been required to be designed to include search and reporting functions to optimize the use of the consolidated data. The Commission requested comment on whether it should allow the consolidated audit trail data to be made available to third parties, such as for academic research.

One commenter supported limiting access to the consolidated audit trail data to the Commission and SROs for regulatory purposes, but suggested it would also be appropriate to share the data with the CFTC.⁶⁵⁶ Other commenters supported the idea of providing “anonymized” data for academic use, as long as appropriate controls were established to assure regulators and market participants that confidential trading information could not be revealed.⁶⁵⁷ Specifically, one commenter endorsed the use of the data “with appropriate safeguards” by academic researchers, explaining that it will “promote understanding of the markets,” and “lead to better policy decisions and thus more fair and orderly markets.”⁶⁵⁸ Similarly, another commenter also supported the use of the data by certain third parties and stated

that “[a]ccess to real-world data can help research immensely.”⁶⁵⁹

The Commission also received a comment that argued for extending access to the consolidated audit trail data to certain individuals who have a fiduciary responsibility to shareholders of a company. This commenter explained that such access would allow them to audit all trading activity in the equity or other derivative securities of that company.⁶⁶⁰

The Commission recognizes there may be certain benefits to the types of expanded access to data in the central repository that has been suggested by various commenters, but, for the reasons discussed below, it is adopting the provisions in Rule 613 regarding access by regulatory authorities at the SROs and the Commission to the systems operated by the central repository, and to the data received, consolidated, and retained by the central repository, substantively as proposed in Rule 613(e)(3), but with one clarification regarding the requirement for access by regulators.⁶⁶¹ Specifically, Rule 613(e)(3), as adopted, provides that “[t]he national market system plan submitted pursuant to this section shall include a provision requiring the creation and maintenance by the plan processor of a method of access to the consolidated data stored in the central repository that includes the ability to run searches and generate reports.” As proposed, Rule 613(e)(3) would have provided that the central repository must have a “reporting function.” The Commission believes that this language is ambiguous and may have implied that the central repository was required to do more than respond to search queries. Accordingly, the Commission is replacing the requirement in proposed Rule 613(e)(3) that the central repository provide “search and reporting functions” with the requirement that there be “the ability to run searches and generate reports.” The change in language from that contained in the Rule, as proposed, is not intended to

⁶⁵⁹ See Albany Letter, p. 1–3. This commenter acknowledged the privacy concerns involved in making the data available for academic research, but stated that researchers have faced similar challenges before and researchers are capable of developing a way to access and share information without the risk of divulging trading strategies or identities. The commenter also stated that data released after a delay would limit the data’s usefulness.

⁶⁶⁰ See Van Bokkelen Letter, p. 1.

⁶⁶¹ See Rule 613(e)(3). See also Rule 613(a)(1)(ii) (requiring the NMS plan to detail how readily the NMS plan will allow data in the central repository to be accessed by regulators, as well as the regulators’ manner of access); see also Section I.I.C.2.a.i., *infra*.

⁶⁵⁰ See Rule 613(e)(6)(iii) through (iv).

⁶⁵¹ See Commission Staff Memorandum, *supra* note 64.

⁶⁵² See Rule 613(a)(1)(ii).

⁶⁵³ See proposed Rule 613(e)(2).

⁶⁵⁴ *Id.*

⁶⁵⁵ See proposed Rule 613(e)(3).

⁶⁵⁶ See Liquidnet Letter, p. 8–9. See also SIFMA Letter, p. 19.

⁶⁵⁷ See Angel Letter, p. 3; Albany Letter, p.1–4; and TIAA–CREF Letter, p.4.

⁶⁵⁸ See Angel Letter, p. 3.

change the substance of the requirement.

In response to the commenter who suggested sharing data with the CFTC, the Commission notes that it has shared information with the CFTC in the past and that it intends to continue sharing information when the situation so warrants. The Commission notes that, among other arrangements, it currently has information-sharing agreements with other regulators. The Commission also agrees with commenters that there may be benefits to allowing academics or other third parties to have access to data collected by the central repository. Academic and other third-party analyses are helpful to the Commission in performing its own evaluation of the economic costs and benefits of regulatory policy. The Commission also notes that one commenter believes that the ability of companies to detect manipulative trading activity in their securities could be enhanced if certain individuals, who have a fiduciary responsibility to shareholders, were given access to limited consolidated audit trail data. However, because the creation and implementation of the consolidated audit trail is in the formative stage, and in light of commenters' concerns about the privacy and security of the information, the Commission believes it is premature to require that the NMS plan require the provision of data to third parties.

Though the Commission is not specifying a particular process, or any details, regarding the mechanism(s) by which regulators will access data in the central repository, the Rule requires the SROs to provide such details and cost estimates in its NMS plan submitted to the Commission for its consideration.⁶⁶² Further, as discussed below in Section III.C.2.c., the Commission is providing the SROs with detailed regulator use cases for how regulators would likely make use of the data in the central repository. These regulator use cases are designed to help the SROs respond with sufficient details in the NMS plan submitted to the Commission for its consideration so that, along with associated cost estimates also required to be provided by the SROs, the Commission and the public will be able to fully consider the NMS plan submitted.

e. Confidentiality of Consolidated Data

Rule 613(e)(4)(i), as proposed, would have required that the NMS plan include policies and procedures, including standards, to be used by the

⁶⁶² See Sections III.C.2.a.i through ii., *infra*; Rule 613(a)(1)(ii) through (vii).

plan processor to ensure the security and confidentiality of all information reported to, and maintained by, the central repository. The plan sponsors and employees of the plan sponsors and central repository would have been required to agree to use appropriate safeguards to ensure the confidentiality of such data, and not to use such data other than for surveillance and regulatory purposes.⁶⁶³ As proposed, Rule 613 also would have required the NMS plan to include mechanisms to ensure compliance by the plan sponsors and their members with the requirements of the plan.⁶⁶⁴

In the Proposing Release, the Commission solicited comments regarding what steps should be taken to ensure appropriate safeguards with respect to the submission of customer information, as well as the receipt, consolidation, and maintenance of such information in the central repository. The Commission requested comment on the issue of appropriate safeguards to be put in place by the SROs and the central repository to help ensure confidentiality. The Commission also asked whether the proposed Rule should: (1) Require that SROs put in place specific information barriers or other protections to help ensure that data is used only for regulatory purposes; (2) provide for an audit trail of the SROs' personnel access to, and use of, information in the central repository to help monitor for compliance with appropriate usage of the data; and (3) include a requirement that the NMS plan include policies and procedures to be used by the plan processor to ensure the security and confidentiality of information reported to, and maintained by, the central repository be expanded to include the content of any searches or queries performed by the SROs or the Commission on the data.⁶⁶⁵

Several commenters expressed concern about how to best ensure the confidentiality of the data collected.⁶⁶⁶ One commenter generally argued that safeguards for the audit trail data had not been sufficiently addressed in the

⁶⁶³ See proposed Rule 613(e)(4)(i). However, a plan sponsor also would be permitted to use the data it submits to the central repository for commercial or other purposes as otherwise permitted by applicable law, rule or regulation. *Id.*

⁶⁶⁴ See proposed Rule 613(h)(3), Rule 613(g)(4).

⁶⁶⁵ See Proposing Release, *supra* note 4, at 32582.

⁶⁶⁶ See Scottrade Letter, p. 2 (expressing concern that trading strategies and confidential customer information could be at risk from cyber-attacks or accidental data breaches); ICI Letter, p. 2–4; Ross Letter, p. 1; Liquidnet Letter, p. 4. See also Ameritrade Letter, p. 3; Thomson Reuters Letter, p. 4; BATS Letter, p. 3; Managed Funds Association Letter, p. 2–3.

Proposing Release.⁶⁶⁷ Another commenter recommended that the operator of the central repository and the SROs be required to implement security policies, processes, and practices consistent with industry best practices for the protection of sensitive information and that such policies, processes, and practices be audited on an annual basis by a third-party expert.⁶⁶⁸ Similarly, one commenter suggested that vendors also should implement best practices with regard to security, reliability, and integrity of data.⁶⁶⁹ Another commenter stated that SROs should be subject to the same privacy and data protection standards as those to which broker-dealers are subject, and that SRO members should not be held responsible, and be indemnified by the SROs, for any breaches of customer or firm information.⁶⁷⁰

One commenter offered several specific recommendations for enhancing the security of audit trail information.⁶⁷¹ This commenter suggested that the Commission should expressly state who would have access to the data, when they could access it, and how they could use it, and further recommended that all data sent to the central repository be encrypted, and that certain fields be “masked” or be subject to delayed end-of-day reporting.⁶⁷² In addition, this commenter suggested that the Commission and each SRO should adopt a robust information security program, and that the Commission should explain how it intends to treat requests for audit trail data.⁶⁷³

Another commenter suggested that the Rule more explicitly enunciate permissible and impermissible uses of the consolidated audit trail and suggested including a requirement regarding the SROs' personnel access to and use of audit trail data, as well as a commitment by the Commission to review each SRO with respect to the adequacy of information barriers.⁶⁷⁴ Similarly, a commenter suggested that access to audit trail data be limited to employees of regulators whose function is to monitor and surveil that market.⁶⁷⁵ This commenter supported the restriction that consolidated audit trail

⁶⁶⁷ See Ameritrade Letter, p. 3–4.

⁶⁶⁸ See Liquidnet Letter p. 4.

⁶⁶⁹ See Thomson Reuters Letter, p. 4.

⁶⁷⁰ See TIAA-CREF Letter, p. 4.

⁶⁷¹ See ICI Letter, p. 2–4.

⁶⁷² *Id.* at 3.

⁶⁷³ *Id.*

⁶⁷⁴ See BATS Letter, p. 3.

⁶⁷⁵ See Managed Funds Association Letter, p. 2–3.

data only be used for regulatory purposes.⁶⁷⁶

One commenter asked how and at what level customer data would be encrypted.⁶⁷⁷ This commenter listed specific aspects of data encryption that would need to be addressed, and noted that potential burdens could be associated with encryption.⁶⁷⁸ Finally, one commenter recommended that the Commission express its intention to withhold audit trail data from the public pursuant to Freedom of Information Act (“FOIA”) ⁶⁷⁹ exemptions.⁶⁸⁰

The Commission considered the concerns expressed by commenters about the sensitivity of much of the information that will be consolidated by the central repository, and believes that maintaining the confidentiality of customer and other information reported to the central repository is essential. Without adequate protections, market participants would risk the exposure of highly-confidential information about their trading strategies and positions.

The Commission notes that it currently has controls and systems for its own use and handling of audit trail information. Nevertheless, given the sensitivity of certain information that will be produced by the consolidated audit trail—as well as the fact that such information should be more readily available and provided in a more usable format than existing audit trail information—the Commission intends to review the controls and systems that it currently has in place for the use and handling of audit trail information. The Commission further intends to evaluate whether any additional controls and systems may be required to adequately protect the sensitive information provided to it under the consolidated audit trail.⁶⁸¹

In addition, adopted Rule 613(e)(4)(i) requires that the NMS plan include policies and procedures that are designed to ensure implementation of the privacy protections that are necessary to assure regulators and market participants that the NMS plan provides for rigorous protection of confidential information reported to the

central repository. Specifically, adopted Rule 613(e)(4)(i)(A) requires that “[a]ll plan sponsors and their employees, as well as all employees of the central repository, agree to use appropriate safeguards to ensure the confidentiality of such data and agree not to use such data for any purpose other than surveillance and regulatory purposes, provided that nothing in [Rule 613(e)(4)(i)(A)] shall be construed to prevent a plan sponsor from using the data that it submits to the central repository for regulatory, surveillance, commercial, or other purposes as otherwise permitted by applicable law, rule, or regulation.” Further, in response to a comment,⁶⁸² adopted Rule 613(e)(4)(i)(B) adds the requirement to the Rule, as proposed, that the plan sponsors adopt and enforce rules that: (1) Require information barriers between regulatory staff and non-regulatory staff with regard to access and use of data in the central repository, and (2) permit only persons designated by plan sponsors to have access to the data in the central repository.⁶⁸³ In addition, the Commission is modifying the Rule, as proposed, to require that the plan processor must: (1) develop and maintain a comprehensive information security program, with dedicated staff, that is subject to regular reviews by the central repository’s CCO, (2) require the central repository to have a mechanism to confirm the identity of all persons permitted to access the data, and (3) maintain a record of all instances where such persons access the data.⁶⁸⁴

The Commission believes these provisions should create a framework for the SROs to establish a thorough and exacting process for helping ensure the continued effectiveness of the confidentiality safeguards. Further, the Commission believes these additional provisions are appropriate because they clarify the types of confidentiality safeguards that the NMS plan submitted to the Commission for its consideration must have to preserve the confidentiality of the information that is received, consolidated, and retained by the central repository. The provision requiring information barriers is

designed to, for example, protect and prevent audit trail data, which are to be used only for regulatory purposes, from being communicated to any personnel at an SRO that are engaged in non-regulatory or business activities. Additionally, the Rule’s requirement that policies and procedures submitted as part of the NMS plan provide that: (i) Only persons designated by the plan sponsors have access to the central repository data, (ii) the plan processor have a mechanism to confirm the identity of all persons permitted access to the data, and (iii) the plan processor maintain a record of all instances where such persons access the data. These provisions are designed to assure regulators and market participants that only designated persons are allowed access to the consolidated audit trail data, and that the central repository will have a method to track such access. With respect to the commenter that suggested the Commission more explicitly enunciate permissible and impermissible uses of the consolidated audit trail,⁶⁸⁵ the Commission notes that any security and confidentiality provisions included in the NMS plan approved by the Commission will be subject to the Commission’s inspection and examination program of SROs to ensure that they are implemented fairly in a manner consistent with the Exchange Act.⁶⁸⁶

The Commission believes that an outline or overview description of the policies and procedures that would be implemented under the NMS plan submitted to the Commission for its consideration would be sufficient to satisfy the requirement of the Rule. The Commission believes it is important for the NMS plan submitted to the Commission to establish the fundamental framework of these policies and procedures, but recognizes the utility of allowing the plan sponsors flexibility to subsequently delineate them in greater detail with the ability to make modifications as needed.

The Commission considered the comment that asked when and at what level customer information would be encrypted.⁶⁸⁷ The Commission notes

⁶⁷⁶ *Id.*

⁶⁷⁷ See Ross Letter, p. 1.

⁶⁷⁸ *Id.*

⁶⁷⁹ 5 U.S.C. 552.

⁶⁸⁰ See ICI Letter, p. 4.

⁶⁸¹ For example, appropriate confidentiality protections will need to be programmed in any Commission systems that collect, store, or access data collected from the central repository. In addition, it may be appropriate to establish multiple access levels for Commission staff so that staff members are allowed only as much access as is reasonably necessary in connection with their duties.

⁶⁸² See ICI Letter, p. 3.

⁶⁸³ Rule 613(e)(4)(i)(B); see ICI Letter, p. 3 (recommending that “the confidential nature of the information supports limiting access to the CAT data to regulators and repository staff”).

⁶⁸⁴ See Rule 613(e)(4)(i)(C). The Commission expects that the central repository’s CCO would be responsible for determining the frequency of these regular reviews in the first instance, in accordance with industry standards for the review of information security, taking into account the sensitivity of the data stored in the central repository. See Rule 613(b)(5) for a description of the CCO.

⁶⁸⁵ See BATS Letter, p. 3. See also Managed Funds Association Letter, p. 2–3.

⁶⁸⁶ The Commission notes that, as part of its inspection and examination program, its staff has the authority to examine the application of any security and confidentiality provisions in the NMS plan to determine whether they have been applied fairly. In this manner, the Commission will be able to monitor how the plan sponsors have applied any such provisions set out in the NMS plan approved by the Commission, and whether their uses of the consolidated audit trail were consistent with the plan and the Exchange Act.

⁶⁸⁷ See Ross Letter, p. 1.

that, while Rule 613 does not require that this information be encrypted, the Rule contains several safeguards, discussed in this section, to ensure the privacy and confidentiality of the audit trail data. Based on these provisions,⁶⁸⁸ the Commission believes that plan sponsors would need to make sure customer information is protected, which could be accomplished by data encryption, if they so choose. Additionally, the Commission notes that the unique customer identifier is only reported once to the central repository—by the broker-dealer that is either originating the order or is the original recipient of the order. Because the unique customer identifier does not travel with the order as it is routed to other market participants, only the originating broker-dealer should be able to determine the identity of the customer of the order. The Commission considered the comment that recommended that the Commission express its intention to withhold audit trail data from the public pursuant to FOIA.⁶⁸⁹ The adopted Rule places no affirmative obligations on the Commission to provide information to any third parties. Further, the Commission believes there are bases under FOIA to withhold customer information, including 5 U.S.C. 552(b)(4) (trade secrets, commercial or financial information), 5 U.S.C. 552(b)(6) (personal information affecting an individual's privacy), and 5 U.S.C. 552(b)(8) (records related to examinations of financial institutions). The Commission intends to assert all appropriate exemptions in response to a FOIA request for information related to the consolidated audit trail's customer information.

The Rule, as adopted, also states that the NMS plan must require the SROs to adopt penalties for non-compliance with any policies and procedures of the plan sponsors or central repository, described above, with respect to information security.⁶⁹⁰ The Commission believes this provision is appropriate because it provides an incentive to SROs to comply with the central repository's information security program. The Commission encourages SROs to include in their comprehensive

information security program developed and maintained by the plan processor provisions for notifying any customer or other market participant whose information may have been compromised by a security breach, so that appropriate remedial steps may be taken.

Additionally, given the importance of the security of data consolidated in the central repository, and in response to the commenter who recommended an annual third-party audit of the security of the central repository,⁶⁹¹ the Commission has added Rule 613(e)(5) to require the NMS plan submitted to the Commission for its consideration to address whether there will be an annual, independent evaluation of the security of the central repository and (1) if so, provide a description of the scope of such planned evaluation, and (2) if not, provide a detailed explanation of the alternative measures for evaluating the security of the central repository that are planned instead. As with most information technology systems, the central repository's system will include measures to assure regulators and market participants of the security of the system. An independent evaluation of the security of the central repository could aid the central repository in identifying and correcting potential areas of weakness or risk. While the Commission is leaving it to the plan sponsors to determine whether the NMS plan will require an annual audit, given the confidential nature of information that will be stored at the central repository, the Commission believes that the NMS plan submitted to the Commission for its consideration must, at a minimum, address whether such an audit is appropriate.

The Commission also notes that, as discussed below,⁶⁹² it is adding a specific provision that requires the NMS plan submitted to the Commission for its consideration to discuss the security and confidentiality of the information reported to the central repository.⁶⁹³ With this information, the Commission, as well as the public, will be able review in detail how the NMS plan proposes to ensure the security and confidentiality of such information in deciding whether to approve the NMS plan.

The Commission believes that, collectively, these provisions are appropriate because of the confidential and commercially valuable information that the central repository will contain. The Commission believes that the purpose and efficacy of the consolidated

audit trail would be compromised if the Commission, the SROs and their members could not rely on the confidentiality and security of the information stored in the central repository. The Commission acknowledges there would be costs associated with a comprehensive information security program, including, but not limited to, compensating a CCO and a dedicated staff, and establishing policies and procedures, as well as for an annual, independent evaluation of the central repository's security (if such an evaluation is required by the NMS plan submitted to the Commission for its consideration) or alternative measures (if such an evaluation is not). Once the SROs have submitted the NMS plan to the Commission that, as required, contains details about the security and confidentiality of the audit trail data, the Commission and the public will be able to consider this information when evaluating the NMS plan.

3. Other Required Provisions of the NMS Plan

a. Compliance With the NMS Plan

1. Exchanges and Associations

As proposed, Rule 613(h) would have provided that each plan sponsor shall comply with the provisions of an NMS plan submitted pursuant to the proposed Rule and approved by the Commission.⁶⁹⁴ In addition, the proposed Rule would have provided that any failure by a plan sponsor to comply with the provisions of the NMS plan could be considered a violation of the proposed Rule.⁶⁹⁵ The proposed Rule also would have required that the NMS plan include a mechanism to ensure compliance by the sponsors with the requirements of the plan.⁶⁹⁶

One commenter expressed concern that there would be competitive implications if the NMS plan were to include provisions that would permit SROs to assess penalties against one another for non-compliance.⁶⁹⁷ This commenter recommended, instead, that the NMS plan include a "fee recoupment" provision so the plan administrator could recoup costs incurred as a result of an error by a particular SRO.⁶⁹⁸ The commenter maintained that a "fee recoupment" provision, coupled with the risk of Commission disciplinary action for a "pattern or practice" of non-

⁶⁸⁸ Specifically, adopted Rule 613(e)(4) requires the NMS plan to include policies and procedures, including standards, to be used by the plan processor to ensure the security and confidentiality of all information submitted to the central repository. In addition, one of the considerations the NMS plan must address is how the security and confidentiality of all information, including customer information, submitted to the central repository, will be ensured. See Rule 613(a)(1)(iv).

⁶⁸⁹ See ICI Letter, p. 4.

⁶⁹⁰ See Rule 613(e)(4)(i)(D).

⁶⁹¹ See Liquidnet Letter, p. 4.

⁶⁹² See Section III.C.2.a.1., *infra*.

⁶⁹³ See Rule 613(a)(1)(iv).

⁶⁹⁴ See proposed Rule 613(h)(1).

⁶⁹⁵ See proposed Rule 613(h)(2).

⁶⁹⁶ See proposed Rule 613(h)(3).

⁶⁹⁷ See Nasdaq Letter I, p. 13.

⁶⁹⁸ *Id.*

compliance, would be a sufficient penalty.⁶⁹⁹

After considering the comment received on the issue of compliance with the NMS plan by exchanges and associations,⁷⁰⁰ the Commission is adopting Rule 613(h) substantially as proposed, with a modification to Rule 613(h)(3) to specify that a mechanism to ensure compliance by the sponsors of the NMS plan with the requirements of the plan “may include penalties where appropriate” and a technical modification to proposed Rule 613(h)(1) and (2).⁷⁰¹ The Commission believes that specifying that the mechanism to ensure compliance by the sponsors of the NMS plan *may* include a penalty provision where appropriate provides the plan sponsors with an appropriate tool—including potential disciplinary action—to help ensure compliance by SROs with the terms and provisions of the NMS plan.⁷⁰² The Commission notes that a penalty provision could provide an incentive for each SRO to comply with all the provisions of the NMS plan because each SRO will seek to avoid incurring any penalty under the Rule. The incentive to avoid a penalty could also reduce the risk of non-compliance with the Rule. The Commission notes, however, that the adopted Rule does not mandate that the NMS plan’s enforcement mechanism include penalties, as there might be other mechanisms to enforce or encourage compliance with the Rule, and the Commission believes that the SROs, in the first instance, should design such mechanisms in their role as plan sponsors. However, the Commission expects that if the SROs design compliance mechanisms that do not incorporate penalties, they would explain in the NMS plan how such mechanisms are expected to help ensure compliance by SROs with the terms and provisions of the NMS plan.⁷⁰³

⁶⁹⁹ *Id.*

⁷⁰⁰ *Id.*

⁷⁰¹ This technical modification simplifies the language of Rule 613(h)(1) and (2) from the proposal. Adopted Rule 613(h)(1) and (2) deletes the language “submitted pursuant to this section” and “of which it is a sponsor.” Adopted Rule 613(h)(1) and (2), like the proposed Rule, requires each SRO to comply with the provisions of the NMS plan “approved by the Commission.” Because each SRO will be a member of the NMS plan approved by the Commission, it is not necessary to include the phrases not adopted.

⁷⁰² Any such provision would be subject to notice and comment pursuant to Rule 608 of Regulation NMS.

⁷⁰³ The Commission notes that any failure by a national securities exchange or national securities association to comply with the provisions of the NMS plan approved by the Commission will be considered a violation of Rule 613, and that the Commission could take appropriate steps to address

With respect to the comment concerning the potential competitive implications of allowing the plan sponsors to impose penalties against each other for non-compliance, the Commission notes that it will carefully review the NMS plan submitted for its consideration, including any proposed mechanisms to help ensure compliance with the NMS plan and the adopted Rule, to help ensure that penalty provisions, if any, are designed to be applied fairly and in a manner consistent with the Exchange Act.⁷⁰⁴ As the central repository will be a facility⁷⁰⁵ of the SROs, the rules governing it must be consistent with the Exchange Act. In addition, any future amendment to the penalty provisions applicable to the SROs would either be reviewed as an amendment to the NMS plan (effected through public notice and comment and taking into account the relevant considerations contemplated by Rule 613(a)(1)) or, because the central repository is a facility of the SROs, as a proposed rule change of the central repository under Section 19 of the Exchange Act.

The Commission notes that the Commission’s examination authority under Section 17 of the Exchange Act⁷⁰⁶ extends to the central repository because it is a facility of the SROs and, thus, the Commission will have the opportunity to inspect the central repository and its books and records for compliance with any penalty provisions set out in the NMS plan. Additionally, the Commission has the authority to review any actions taken under the NMS plan, pursuant to Rule 608(d)(1) of Regulation NMS,⁷⁰⁷ for burdens on competition, among other matters.⁷⁰⁸

In response to the comment suggesting a “fee recoupment” provision in the NMS plan, the Commission notes that Rule 613(b)(4), as adopted, provides that “[t]he national market system plan submitted pursuant to this section shall include a provision addressing the manner in which the costs of operating the central repository will be allocated among the national securities exchanges and national securities associations that are sponsors of the plan, including a provision addressing the manner in which costs will be allocated to new sponsors to the plan.” In this regard, to the extent a “fee recoupment” is a method for recouping

such a violation, including imposing penalties as appropriate. See Rule 613(h)(2).

⁷⁰⁴ See Section III.B.2.a., *supra*.

⁷⁰⁵ See *supra* note 581 (describing the nature of a “facility”).

⁷⁰⁶ 15 U.S.C. 78q.

⁷⁰⁷ 17 CFR 242.608(d)(1).

⁷⁰⁸ *Id.*

costs incurred by the central repository as a result of an error in reporting to the consolidated audit trail, as stated by a commenter,⁷⁰⁹ the Commission notes that, pursuant to Rule 613(b)(4), the plan sponsors may, if they deem it appropriate, include a fee recoupment provision in the NMS plan submitted to the Commission for its consideration.⁷¹⁰

2. Members

Proposed Rule 613(g) would have included provisions to subject members of each SRO to the requirements of Rule 613. Specifically, as proposed, the Rule would have required each SRO to file with the Commission, pursuant to Section 19(b)(2) of the Exchange Act⁷¹¹ and Rule 19b-4 thereunder,⁷¹² a proposed rule change to require its members to comply with the requirements of the proposed Rule and the NMS plan.⁷¹³ Further, the proposed Rule directly would have required each member to (1) collect and submit to the central repository the information required by the Rule, and (2) comply with the clock synchronization requirements of the proposed Rule.⁷¹⁴ The proposed Rule also would have required that the NMS plan include a provision that each SRO, by subscribing to and submitting the plan to the Commission, agrees to enforce compliance by its members with the provisions of the plan.⁷¹⁵ Finally, the proposed Rule would have required the NMS plan to include a mechanism to ensure compliance with the requirements of the plan by the members of each SRO that is a sponsor of the NMS plan submitted pursuant to this Rule and approved by the Commission.⁷¹⁶

One commenter expressed the view that “enforcement of [the consolidated audit trail] . . . should be accomplished through a policies and procedures rule framework—similar to that of Regulation NMS. To enforce the rule from a strict liability perspective would simply be the wrong approach and would result in thousands of technical

⁷⁰⁹ See Nasdaq Letter I, p. 13.

⁷¹⁰ Any such provision would be subject to notice and comment pursuant to Rule 608 of Regulation NMS.

⁷¹¹ 15 U.S.C. 78s(b)(2).

⁷¹² 17 CFR 240.19b-4.

⁷¹³ See proposed Rule 613(g)(1). This provision in the proposed Rule echoes the requirement contained in Rule 608 that “each self-regulatory organization also shall, absent reasonable justification or excuse, enforce compliance with any such plan by its members and persons associated with its members.” 17 CFR 242.608(c).

⁷¹⁴ See proposed Rule 613(g)(2).

⁷¹⁵ See proposed Rule 613(g)(3).

⁷¹⁶ See proposed Rule 613(g)(4).

(non-material) violations, which is clearly not the intent of the rule.”⁷¹⁷

After considering the comment regarding Rule 613’s provisions on compliance with the Rule by members of the SROs, the Commission is adopting Rule 613(g) substantially as proposed, with technical modifications to proposed Rule 613(g). These technical modifications simplify the language of Rule 613(g). Adopted Rule 613(g) does not include the phrase that applied the requirements therein to each member of an SRO “that is a sponsor of the national market system plan submitted pursuant to this section and approved by the Commission.” Because each SRO will be a member of the NMS plan approved by the Commission, it is not necessary to include the deleted language.

In addition, the Commission modified Rule 613(g)(2) as proposed to provide that, “[e]ach member of a national securities exchange or national securities association shall comply with all the provisions of any approved national market system plan applicable to members.” This change requires members to comply with all applicable provisions of the NMS plan as approved by the Commission instead of with the specific provisions contained in the Rule relating to recording and reporting data and clock synchronization since the requirements contained in the NMS plan may differ or be more specific than the requirements stated in the Rule.

To be in compliance with the NMS plan, members must record and report all data elements required by the NMS plan within the time specified in the plan. To this end, the plan sponsors must develop a way to ensure that each member that takes action with respect to an order (e.g., originates, receives, routes, modifies, cancels or executes an order) records and reports all required elements associated with a reportable event, as the plan sponsors must also develop a mechanism to address any lapses in compliance with the NMS plan with a goal of ensuring the central repository is receiving a complete record of the life of an order.

The Commission does not agree with the commenter that believed that enforcement of the consolidated audit trail will necessarily “result in thousands of technical (non-material) violations, which is clearly not the intent of the rule.”⁷¹⁸ The Commission notes that the adopted Rule does not address the means of achieving compliance with the requirements of the consolidated audit trail. Rather, adopted

Rule 613(g) simply provides that the SROs must submit proposed rule changes to require their members to comply with the requirements of an NMS plan approved by the Commission.

The Commission acknowledges there would be costs to the SROs for filing with the Commission proposed rule changes to require their members to comply with Rule 613 and the NMS plan approved pursuant thereto. The Commission, however, believes that the Rule should include these rule filing requirements for the reasons discussed above.

b. Operation and Administration of the NMS Plan

Proposed Rule 613(b) sets forth requirements concerning the operation and administration of the NMS plan. As proposed, Rule 613(b)(1) would have required that the NMS plan include a governance structure to ensure fair representation of the plan sponsors and provisions governing the administration of the central repository, including the selection of a plan processor. Rule 613(b)(2), as proposed, also would have required the plan sponsors to include in the NMS plan a provision addressing the requirements for the admission of new sponsors to the plan and the withdrawal of sponsors from the plan. In addition, proposed Rule 613(b)(3) would have required the NMS plan to include a provision addressing the percentage of votes required by the plan sponsors to effectuate amendments to the plan, and proposed Rule 613(b)(4) would have required that the plan sponsors develop a process for allocating among themselves the costs associated with creating and maintaining the central repository, including a provision addressing the manner in which such costs would be allocated to sponsors who join the plan after it has been approved.

Finally, proposed Rule 613(b)(5) would have required the NMS plan to require the appointment of a CCO to regularly review the operation of the central repository to assure its continued effectiveness in light of market and technological developments, and make any appropriate recommendations to the plan sponsors for enhancement to the nature of the information collected and the manner in which it is processed. In the Proposing Release, the Commission stated that it expected the CCO would establish the procedures necessary to ensure that the operations of the central repository keep pace with technical developments and to make any necessary upgrades or

changes to the central repository to maintain its efficacy.⁷¹⁹

The Commission received comments addressing the proposed requirements for operation and administration of the NMS plan.⁷²⁰ One commenter suggested that the NMS plan should contain a voting mechanism that requires less than unanimity, and with an effective tie breaking mechanism.⁷²¹ This commenter also recommended that the governance structure “limit the ability of individual SROs to make modifications on a unilateral basis that could escalate costs by forcing the operator and firms to absorb costs that do not advance the interests of investors.”⁷²²

Two commenters expressed views on the selection and role of the plan processor.⁷²³ One suggested that the SROs should select the processor through a “request for proposal.”⁷²⁴ Another commenter generally believed that the allocation of plan processor costs warranted more consideration.⁷²⁵ This commenter expressed concern with regard to the SROs owning the plan processor, noting in particular that unanimous consent would be required for all board actions.⁷²⁶ This commenter stated that the plan processor alone should handle rulemaking and compliance, subject to oversight by an “industry group.”⁷²⁷ Another commenter stated that, “[r]egarding the governance of the national market system plan [contemplated] by the proposal, we wish to reiterate that the SEC should provide the broker-dealer industry with an official ‘seat at the table’ alongside the SROs, so that [the broker-dealers] can review and comment on system requirements as they are being developed and vote on plan amendments going forward.”⁷²⁸

After considering these comments, for the reasons discussed below, the Commission is adopting Rule 613(b) as proposed, but with the addition of two new requirements. Specifically, in addition to the provisions included in the proposed rule,⁷²⁹ Rule 613(b), as

⁷¹⁹ See Proposing Release, *supra* note 4, at 32585.

⁷²⁰ See Nasdaq Letter I, p. 3, 13; Direct Edge Letter, p. 5; FIF Letter, p. 1, 8; FINRA Letter, p. 15; SIFMA February 2012 Letter, p. 1.

⁷²¹ See Nasdaq Letter I, p. 3, 13.

⁷²² *Id.* at p. 3.

⁷²³ See FIF Letter, p. 1; Direct Edge Letter, p. 5.

⁷²⁴ See FIF Letter, p. 8.

⁷²⁵ See Direct Edge Letter, p. 4–5.

⁷²⁶ *Id.* at p. 5.

⁷²⁷ *Id.*

⁷²⁸ See SIFMA February 2012 Letter, p. 1.

⁷²⁹ Proposed Rule 613(b) required that the NMS plan include “a governance structure to ensure fair representation of the plan sponsors, and administration of the central repository, including

Continued

⁷¹⁷ See Knight Letter, p. 3.

⁷¹⁸ See Knight Letter, p. 3.

adopted, provides that the national market system plan submitted shall include: “a provision requiring the plan sponsors to provide to the Commission, at least every two years after effectiveness of the national market system plan, a written assessment of the operation of the consolidated audit trail * * *, [and] an Advisory Committee * * * includ[ing] representatives of the member firms of the plan sponsors.”⁷³⁰

The requirement that the NMS plan require the appointment of a CCO to regularly review the operation of the central repository and make any appropriate recommendations for enhancements⁷³¹ is one method to facilitate the consolidated audit trail’s ability to evolve over time in terms of technology, functionality, and accuracy. Adopted Rule 613(b)(6) supplements this requirement by now requiring that the NMS plan “include a provision requiring the plan sponsors to provide to the Commission, at least every two years after effectiveness of the national market system plan, a written assessment of the operation of the consolidated audit trail. Such document shall include, at a minimum: (i) [a]n evaluation of the performance of the consolidated audit trail including, at a minimum, with respect to data accuracy (consistent with [Rule 613(e)(6)]), timeliness of reporting, comprehensiveness of data elements, efficiency of regulatory access, system speed, system downtime, system security (consistent with [Rule 613(e)(4)]), and other performance metrics to be determined by the Chief Compliance Officer, along with a description of such metrics; (ii) [a] detailed plan, based on such evaluation, for any potential improvements to the performance of the consolidated audit trail with respect to any of the following: improving data accuracy; shortening reporting timeframes;

the selection of the plan processor, * * * [a] provision addressing the requirements for the admission of new sponsors of the plan and the withdrawal of existing sponsors from the plan, * * * [a] provision addressing the percentage of votes required by the plan sponsors to effectuate amendments to the plan, * * * [a] provision addressing the manner in which the costs of operating the central repository will be allocated among the national securities exchanges and national securities associations that are sponsors of the plan, including a provision addressing the manner in which costs will be allocated to new sponsors to the plan* * * [and the] appointment of a Chief Compliance Officer to regularly review the operation of the central repository to assure its continued effectiveness in light of market and technological developments, and make any appropriate recommendations for enhancements to the nature of the information collected and the manner in which it is processed.”

⁷³⁰ See Rule 613(b)(6); Rule 613(b)(7).

⁷³¹ See Rule 613(b)(5).

expanding data elements; adding granularity and details regarding the scope and nature of Customer-IDs; expanding the scope of the NMS plan to include new instruments, and new types of trading and order activities; improving the efficiency of regulatory access; increasing system speed; reducing system downtime; and improving performance under other metrics to be determined by the Chief Compliance Officer; (iii) [a]n estimate of the costs associated with any such potential improvements to the performance of the consolidated audit trail, including an assessment of the potential impact on competition, efficiency, and capital formation; and (iv) [a]n estimated implementation timeline for any such potential improvements, if applicable.”⁷³² The Commission believes these provisions will help plan sponsors understand and evaluate any deficiencies in the operation of the consolidated audit trail and to propose potential enhancements to the NMS plan, as appropriate, taking cost effectiveness into consideration. These provisions also will allow the Commission to assess any such potential improvements, accounting for the considerations contemplated by Rule 613(a)(1), the specific requirements of the approved NMS plan, and any changes or additions to these requirements that the Advisory Committee, the SROs, or the Commission may wish to consider in the future. The Commission believes that such enhancements, if any, to the consolidated audit trail could improve the ability of the SROs and the Commission to conduct effective market oversight by keeping up with continually-changing technologies and markets, by, for example, allowing the SROs and the Commission to conduct their market oversight more quickly, accurately, and/or comprehensively, as well as possibly at lower costs. Similarly, the Commission believes that adding granularity and details regarding the scope and nature of Customer-IDs, adding new instruments, or including new trading or order activities could allow regulators to have a more complete picture of the markets and market participants, which could also lead to more effective market oversight. The Commission believes that performing this assessment no later than every two years is reasonable given the rapid speed at which the markets and

⁷³² See Rule 613(b)(6). The written assessment could also further inform the extent to which it could be appropriate to share certain information collected by the consolidated audit trail with third parties. See Section III.B.2.d.

related technologies are evolving. The Commission also believes that the written assessment, required by Rule 613(b)(6), will help inform the Commission about the likely feasibility, costs, and impact of, and the plan sponsors’ approach to, the consolidated audit trail evolving over time. The Commission would expect to make the document publicly available on its Web site.

In response to the comment requesting that the broker-dealer industry receive a “seat at the table” regarding governance of the NMS plan,⁷³³ the adopted Rule requires that the NMS plan submitted to the Commission for its consideration include a provision requiring the creation of an Advisory Committee, composed at least in part by representatives of the members of the plan sponsors, “to advise the plan sponsors on the implementation, operation and administration of the central repository.”⁷³⁴ Further, the adopted Rule requires that the NMS plan submitted to the Commission for its consideration require that “[m]embers of the Advisory Committee shall have the right to attend any meetings of the plan sponsors, to receive information concerning the operation of the central repository, and to provide their views to the plan sponsors.”⁷³⁵ Pursuant to the Rule, the NMS plan also shall set forth the term and composition of the Advisory Committee, which composition shall include representatives of the member firms of the plan sponsor.⁷³⁶ The Rule further provides that the plan sponsors may meet without the Advisory Committee members in executive session if, by affirmative vote of a majority of the plan sponsors, the plan sponsors determine that such an executive session is required.⁷³⁷ The Commission believes that, given the scope of the Rule, both in terms of the market participants that may be affected by the Rule and the breadth of the audit trail information that will be collected, it is important that the plan sponsors solicit input from their members because this could help inform the plan sponsors of any expected or unexpected operational or technical issues that may arise in the implementation of the Rule and/or the operation of the central repository, and help assure the Commission and market participants that any requirements imposed on SRO members will be

⁷³³ See SIFMA February 2012 Letter, p. 1.

⁷³⁴ See Rule 613(b)(7)(i).

⁷³⁵ See Rule 613(b)(7)(ii).

⁷³⁶ See Rule 613(b)(7)(i).

⁷³⁷ See Rule 613(b)(7)(ii).

accomplished in a manner that takes into account the burdens on SRO members. The Commission believes that the Advisory Committee could provide members of the SROs with a forum for informing the plan sponsors of any potential implementation or operational issues faced by them in connection with the consolidated audit trail. Plan sponsors also will be able to draw on the knowledge and experience of these members to help assure the Commission and market participants that any requirements imposed on SRO members will be accomplished in a manner that takes into account the costs to SRO members. The Commission also believes that an Advisory Committee could help foster industry consensus on how to approach and resolve possible issues that may be disputed, and approaches that may conflict, regarding operation of the consolidated audit trail. In this regard, the Commission encourages the plan sponsors to, in the NMS plan, provide for an Advisory Committee whose composition includes SRO members from a cross-section of the industry, including representatives of small-, medium- and large-sized broker-dealers.

The Commission believes the requirement for the NMS plan to create the Advisory Committee, as well as the requirement in Rule 613(a)(1)(xi), discussed below, that requires the NMS plan to require a discussion of the process by which the plan sponsors solicited the views of their members on the creation, implementation, and maintenance of the consolidated audit trail, a summary of those views, and how the plan sponsors took those views into account when preparing the NMS plan, are responsive to commenters' views that more input by industry representatives, such as members of the SROs who are subject to the requirements of Rule 613, would be advantageous to the creation, implementation, and maintenance of the consolidated audit trail.⁷³⁸

In addition, because the members of the Advisory Committee will have the right to attend all meetings of the plan sponsors (with the exception of executive sessions), to receive information concerning the operation of the central repository, and to provide their views to the plan sponsors, the governance process of the central repository will be more transparent to all market participants that will be affected by Rule 613. Further, the Commission believes the inclusion of SRO members on the Advisory

⁷³⁸ See Rule 613(a)(1)(xi); Section III.C.2.a.iii.c., *infra*, for a discussion of the tenth consideration.

Committee will increase the efficacy of the central repository. These market participants will have first-hand experience with the operation of the central repository, as they are required to report data to the facility, allowing them to provide informed input on any problems currently facing the central repository of which they are aware, and on any future actions that the central repository might or should take to address such problems. Finally, the Commission believes that an Advisory Committee structure that also permits the plan sponsors to meet in executive session without members of the Advisory Committee appropriately balances the need to provide a mechanism for industry input into the operation of the central repository, against the regulatory imperative that the operations and decisions regarding the consolidated audit trail be made by SROs who have a statutory obligation to regulate the securities markets, rather than by members of the SROs, who have no corresponding statutory obligation to oversee the securities markets.

The Commission also considered the comment that provided other suggestions on the governance of the NMS plan and believes that the commenter's concerns regarding a unanimity requirement in the NMS plan have merit.⁷³⁹ Accordingly, the Commission urges the SROs to take into account the need for efficient and fair operation of the NMS plan governing the consolidated audit trail, and consider the appropriateness of a unanimity requirement and the possibility of a governance requirement other than unanimity, or even super-majority approval, for all but the most important decisions. The Commission believes that an alternate approach may be appropriate to avoid a situation where a significant majority of plan sponsors—or even all but one plan sponsor—supports an initiative but, due to a unanimous voting requirement, action cannot be undertaken.⁷⁴⁰ Therefore, the Commission believes the SROs should consider alternative governance structures that would ensure that decisions made by the SROs are both achieved and implemented efficiently, in the interest of advancing the Commission's mission. The Commission notes that the NMS plan submitted to the Commission for its consideration will be published for public comment, and industry

⁷³⁹ See Nasdaq Letter I, p. 3, 13.

⁷⁴⁰ See, e.g., Options Order Protection and Locked/Crossed Market (Securities Exchange Act Release No. 60405 (July 30, 2009), 74 FR 39362 (August 6, 2009)) (including a unanimous voting requirement).

participants will have an opportunity at that time to submit comments on the governance structures proposed by the plan sponsors. Further, the Commission believes, as discussed above, that unanimity need not be the standard for decision-making with regard to matters relating to the operation of the consolidated audit trail. Thus, the plan sponsors have flexibility under the Rule to determine the governance structures that will facilitate the effective and efficient oversight of the plan processor.

In response to the comments regarding the selection and role of the plan processor,⁷⁴¹ the Commission believes that the SROs, as the plan sponsors of the NMS plan governing the operation of the consolidated audit trail, should retain the authority to select and oversee the plan processor. The Commission believes that the SROs are in the best position to understand how the plan processor should operate and to address the need for changes when necessary. The SROs also have the flexibility under the Rule to consult the Advisory Committee, for example, to assist the SROs in their selection process and in their determination of whether modifications are necessary to address innovations in the industry if they believe that such participation is needed.

The Commission acknowledges that, in addition to the many costs and burdens associated with the creation, implementation, and maintenance of a consolidated audit trail, with regards to the specific requirements discussed in this section, there would be costs to the SROs for appointing a CCO to the central repository, providing the Commission with the written assessment of the operation of the consolidated audit trail, and creating an Advisory Committee.⁷⁴² For the reasons discussed above, the Commission believes these requirements are important to the efficient operation and practical evolution of the consolidated audit trail, and are responsive to many commenters' concerns about governance structure, cost allocations, and the inclusion of SRO members as part of the planning process. The Commission is therefore requiring the SROs to include these requirements in the NMS plan submitted to the Commission for its consideration. After the SROs submit

⁷⁴¹ See FIF Letter, p. 1; Direct Edge Letter, p. 5.

⁷⁴² As discussed and for the reasons set forth in Section I, *supra*, in light of the multi-step process for developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail, the Commission is deferring a detailed analysis of costs and benefits of this requirement of the Rule until after the NMS plan has been submitted.

the NMS plan, the Commission and the public will have more detailed information in evaluating the NMS plan.

c. Surveillance

As proposed, Rule 613(f) would have required each SRO subject to the Rule to develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated audit trail data. The Rule, as proposed, also would have required each SRO to implement its new or enhanced surveillance system within fourteen months after the effectiveness of the NMS plan.⁷⁴³

Commenters generally expressed support for the proposal's requirement that SROs implement surveillance systems that make use of the consolidated information.⁷⁴⁴ One commenter stated that the enhanced surveillance that could be achieved with the audit trail would likely attract additional trading volume to the U.S. markets and that the consolidated audit trail would benefit the SROs by permitting them to conduct surveillance themselves, thus "reducing their risks and their costs."⁷⁴⁵ Another commenter noted that the proposed consolidated audit trail would be a "critical first step toward consolidated market surveillance," and would lower costs for markets and their participants through economies of scale.⁷⁴⁶ A third commenter opined that a centralized database such as the consolidated audit trail is necessary to bring together data from exchanges, ECNs, and dark pools to properly regulate trading.⁷⁴⁷ However, one commenter maintained that a "Commission-mandated market regulator" would be costly for the securities industry and create the potential for a lack of surveillance innovation.⁷⁴⁸ A commenter recommended that the Commission monitor the surveillance systems and provide guidance to the SROs in establishing their surveillances.⁷⁴⁹ Finally, one commenter suggested that outsourcing surveillance to regulators could result in lower costs for markets, and recommended several specific security and analytical features for such a surveillance system.⁷⁵⁰

After considering the comments, for the reasons discussed below, the Commission is adopting Rule 613(f) as proposed. Specifically, the Rule requires that each SRO develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the consolidated audit trail.⁷⁵¹ The Commission believes that it is appropriate to require SROs to enhance their surveillance programs to make full use of the increased functionalities and the timeliness of the consolidated audit trail. Additionally, because trading and potentially manipulative activities could take place across multiple markets, the Commission supports efforts to coordinate surveillance among the SROs, such as through a plan approved pursuant to Rule 17d-2 under the Exchange Act,⁷⁵² or through regulatory services agreements between SROs. In this regard, as commenters have noted, SROs could "outsource" surveillance efforts to another SRO, if there are efficiencies to be gained. With respect to the comment regarding the benefits to be gained by creating a "single market regulator," the Commission believes that mandating such an entity or structure goes beyond the scope of the Rule.⁷⁵³

The Commission notes that it intends to review its own surveillance activities in light of the consolidated audit trail and intends to take steps to enhance its surveillance capabilities to take advantage of consolidated audit trail data. The Commission anticipates that such steps will be informed by—and may in turn help inform—the surveillance enhancement measures required to be taken by the SROs under adopted Rule 613(f).

The Commission also is adopting Rule 613(a)(3)(iv) as proposed, which requires the NMS plan to require each SRO to implement its new or enhanced surveillance system within fourteen months after the effectiveness of the NMS plan. Since Rule 613(a)(3)(iii) will require the NMS plan to require SROs to begin reporting to the central repository within one year after effectiveness of the NMS plan, the Commission believes the two additional months provided by this timeframe is reasonable and sufficient to allow SROs

to update their surveillance systems and allow for testing of new surveillances.

The Commission acknowledges there would be costs to the SROs for developing and implementing surveillance systems, or enhancing existing surveillance systems, reasonably designed to make use of the consolidated audit trail. However, the Commission believes it may be possible for SROs to retire some of their existing, and perhaps less-efficient, audit trail and surveillance systems once the consolidated audit trail is operational. As discussed in Section III.C.a.iv. below, the adopted Rule requires the SROs to consider and discuss the potential for costs savings if other SRO systems, and their associated surveillances, were migrated to the consolidated audit trail.⁷⁵⁴ Once such information is submitted in the NMS plan submitted to the Commission for its consideration, the Commission and the public will be able to consider the information in evaluating the NMS plan.

C. NMS Plan Process

As proposed, Rule 613(a)(1) would have required each SRO to jointly file on or before 90 days from approval of the Rule an NMS plan to govern the creation, implementation, and maintenance of a consolidated audit trail and a central repository. Section III.A. above discusses the use of an NMS plan to create, implement, and maintain a consolidated audit trail. This Section focuses on the process the SROs must follow when submitting to the Commission the NMS plan that satisfies the requirements discussed in Section III.B. above and the process the Commission will undergo when evaluating whether to approve the NMS plan.

1. Comments on the NMS Plan Process

The Commission received several comments regarding how best to develop an NMS plan that will govern the creation and implementation of a consolidated audit trail, as well as the time needed to do so. Several commenters suggested that the Commission undergo a RFP or RFI process to create a consolidated audit trail.⁷⁵⁵ Specifically, one commenter suggested that the Commission outline a set of goals it intends to achieve through creation of a consolidated audit trail and allow an industry working group to

⁷⁴³ See proposed Rule 613(a)(3)(iv).

⁷⁴⁴ See Nasdaq Letter I, p. 10; Thomson Reuters Letter, p. 4.

⁷⁴⁵ See Thomson Reuters Letter, p. 4.

⁷⁴⁶ See FINRA/NYSE Euronext Letter, p. 3-4. See also Nasdaq Letter I, p. 8.

⁷⁴⁷ See IAG Letter, p. 2.

⁷⁴⁸ See BATS Letter, p. 2-3.

⁷⁴⁹ See Nasdaq Letter I, p. 10.

⁷⁵⁰ See iSys Letter, p. 2-3.

⁷⁵¹ See Rule 613(f).

⁷⁵² 17 CFR 240.17d-2.

⁷⁵³ The Commission has examined the issue of a single market regulator in the past, specifically in the Intermarket Trading Concept Release (see Securities Exchange Act Release No. 47849 (May 14, 2003), 68 FR 27722 (May 20, 2003)); however, a single regulator structure is not suggested by the adopted Rule.

⁷⁵⁴ These cost savings may accrue to any SRO that would no longer need to operate a retired system, as well as to any SRO members that would no longer be required to report to such systems.

⁷⁵⁵ See FIF Letter, p. 1, 9; FIF Letter II, p. 1-2; STA Letter, p. 2; Direct Edge Letter, p. 2-3, 5. See also Section II.C.3.

determine the data elements that must be reported and other technical requirements.⁷⁵⁶ Another commenter opined that an RFP process would facilitate the identification of the costs and benefits of the audit trail, as well as the consideration of a wider range of technological solutions.⁷⁵⁷ Further, some commenters requested more specific information about the audit trail system to determine the best approach for implementing the consolidated audit trail.⁷⁵⁸

Some of these commenters stressed that more time should be allotted for the planning and design of the NMS plan due to the comprehensive business analysis that would be needed in the initial stages of the consolidated audit trail.⁷⁵⁹ Commenters recommended extensive, “up-front business analysis,”⁷⁶⁰ explaining that if conducted “during the CAT plan development process, [they] are confident that issues would emerge earlier in the process, leading to more efficient and cost-effective solutions.”⁷⁶¹ The commenters believed that the business analysis would require many discussions involving the Commission, the SROs and teams comprising members of the securities industry.⁷⁶² The commenters also suggested that the business analysis could include an RFI “to engage potential solution providers early in the process,”⁷⁶³ and stated that the time needed to perform the analysis to produce a “detailed blueprint for CAT”⁷⁶⁴ would be closer to six months,⁷⁶⁵ rather than the proposed 90 days.⁷⁶⁶ As a basis for their suggestions, one of the commenters provided a breakdown of the time and the types of work needed for FINRA’s expansion of OATS to all NMS securities.⁷⁶⁷ This

commenter noted that over one-third of the time required for the project was spent on conducting business analysis, and that one-third of the time was spent on project development.⁷⁶⁸

In addition, some commenters noted that a consolidated audit trail could be implemented in a number of ways, and thus recommended that the Commission replace the specific system requirements of the proposed Rule with more general “end-user” requirements, perform an analysis of how existing audit trail systems do and do not meet the needs of regulators, and perhaps even engage in a formal RFP process.⁷⁶⁹

2. Adopted Rule

After considering the comments regarding the NMS plan process, the Commission is adopting proposed Rule 613(a)(1) with modifications. First, the Rule now requires the SROs to provide much more information and analysis to the Commission as part of their NMS plan submission. These requirements have been incorporated into the adopted Rule as “considerations” that the SROs must address, and generally mandate that the NMS plan discuss: (1) The specific features and details of the NMS plan (e.g., how data will be transmitted to the central repository, and when linked data will be available to regulators); (2) the SROs’ analysis of NMS plan costs and impact on efficiency, competition, and capital formation; (3) the process followed by the SROs in developing the NMS plan (e.g., solicitation of input from members of the SROs); and (4) the information about the implementation and milestones of the consolidated audit trail. Second, the Commission is furnishing further details about how it envisions regulators would use, access, and analyze consolidated audit trail data through a number of “use cases.” Third, the Commission is extending the amount of time allowed for the SROs to submit the NMS plan from 90 days from the date of approval of Rule 613 to 270 days from the date of publication of the Adopting Release in the **Federal Register**. A discussion of these modifications and the “use cases” follows.

a. NMS Plan Considerations

As noted above,⁷⁷⁰ the Commission believes that the collective effect of the modifications and additions described above will be to significantly expand the solution set that could be considered by

the SROs for creating, implementing, and maintaining the consolidated audit trail and provide the SROs with increased flexibility in how they choose to meet the requirements of the adopted Rule. Further, given these changes to the Rule discussed above and the wide array of commenter’s views on how to best implement a consolidated audit trail,⁷⁷¹ the Commission expects that the SROs will seriously consider various options as they develop the NMS plan to be submitted to the Commission for its consideration. The costs and benefits of the consolidated audit trail are highly dependent on the specific solutions proposed by SROs.

Accordingly, as part of the multi-step process for developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail, the Commission is deferring its economic analysis of the actual creation, implementation, and maintenance of a consolidated audit trail itself (in contrast to the costs of the actions the SROs are required to take upon approval of the adopted Rule⁷⁷²) until such time as it may approve the NMS plan submitted to the Commission for its consideration. In light of the expanded set of solutions that should be available as a result of the changes described above and to facilitate a more robust economic analysis, the adopted Rule now requires the SROs to provide much more information and analysis to the Commission as part of their NMS plan submission. The Commission is therefore requiring the SROs to discuss, as part of their NMS plan “considerations” that detail how the SROs propose to implement the requirements of the plan, cost estimates for the proposed solution, and a discussion of the costs and benefits of alternate solutions considered but not proposed.

This additional information and analysis are intended to ensure that the Commission and the SROs have sufficiently detailed information to carefully consider all aspects of the NMS plan ultimately submitted by the SROs, facilitating an analysis of the extent to which the NMS plan would allow regulators to effectively and

⁷⁷¹ See, e.g., FINRA Letter, p. 14 (advocating that SROs build off existing audit trails to develop a consolidated audit trail) and Nasdaq Letter I, p. 11–12 (arguing against building off existing audit trail systems and supporting the development of new system to establish a consolidated audit trail). See also Section II.C.4., *supra*.

⁷⁷² These actions include the requirement that the SROs develop an NMS plan, utilizing their own resources and undertaking their own research that addresses the specific details, cost estimates, considerations, and other requirements of the Rule.

⁷⁵⁶ See FIF Letter II, p. 2.

⁷⁵⁷ *Id.* at p. 3.

⁷⁵⁸ See Broadridge Letter, p. 2; FIF Letter, p. 8. See also Ross Letter, p. 1 (discussing examples of information security details to consider); Nasdaq Letter I, p. 6 (stating that the proposed Rule provided “incomplete technical information on which design and features make the most sense”).

⁷⁵⁹ See FIF Letter II, p. 2–3; STA Letter, p. 2. See also Nasdaq Letter I, p. 6.

⁷⁶⁰ See FIF Letter II, p. 1, 3; STA Letter, p. 1, 3. See also Nasdaq Letter I, p. 6.

⁷⁶¹ See FIF Letter II, p. 2; STA Letter, p. 1.

⁷⁶² See FIF Letter II, p. 1; STA Letter, p. 1–2.

⁷⁶³ See FIF Letter II, p. 2; STA Letter, p. 2.

⁷⁶⁴ See FIF Letter II, p. 1–2; STA Letter, p. 2.

⁷⁶⁵ See FIF Letter II, p. 2; STA Letter, p. 2–3.

⁷⁶⁶ See proposed Rule 613(a)(1).

⁷⁶⁷ See FIF Letter II, p. 3. The commenter also provided the cost to the industry for the expansion of OATS to all NMS stocks—\$48 million. The Commission notes that this is the cost for the project as a whole, not solely for the planning phase, and therefore is not entirely attributable to the cost of the creation and filing of the NMS plan required by Rule 613.

⁷⁶⁸ The time remaining was spent on “testing and other activities.” See FIF Letter II, p. 3.

⁷⁶⁹ See Nasdaq Letter I, p. 12; FIF Letter II, p. 2–3; STA Letter, p. 1–3; Direct Edge Letter, p. 2–3, 5.

⁷⁷⁰ See Section I., *supra*.

efficiently carry out their responsibilities. The NMS plan submitted by the SROs will be published for public comment and reviewed by the Commission for consistency with the Exchange Act and the rules thereunder. As a result, all interested persons, including market participants, regulatory authorities, and the general public, will have an opportunity to provide meaningful comments on the details and costs of the NMS plan submitted, which the Commission will review and consider.

i. Features and Details of the NMS Plan

The first six considerations the Rule requires the SROs to address in the NMS plan relate to the features and details of the NMS plan. These six considerations require the NMS plan to specify and explain the choices made by the SROs to meet the requirements specified in the Rule for the consolidated audit trail. The Commission intends to use the discussion of these considerations to evaluate the NMS plan submitted for its consideration and how well it meets the objectives described in Section II.B.2.

• Rule 613(a)(1)(i)

Rule 613(a)(1)(i) requires the NMS plan submitted to discuss “[t]he method(s) by which data is reported to the central repository, including, but not limited to, the sources of such data and the manner in which the central repository will receive, extract, transform, load and retain such data. * * *” The Rule also requires the NMS plan to discuss the basis for selecting such method(s).

The Commission believes that requiring that the NMS plan discuss the method(s) by which data is reported to the central repository is important because the method for reporting data and the source of the data are significant to the effectiveness of the consolidated audit trail and could affect, and potentially enhance, the reliability and the accuracy of the data that is reported to the central repository.⁷⁷³ Discussing such method(s), as well as the basis for selecting such method(s), should help assure the Commission that the plan sponsors have considered the various alternatives and selected the method(s) that best achieves the objectives of the consolidated audit trail in a cost-effective manner.⁷⁷⁴ In addition, Rule 613(a)(1)(i) requires that the NMS plan

describe how the central repository will receive, extract, transform, load, and retain data because the Commission believes that this information is integral to a comprehensive understanding of the operation of the central repository proposed in the NMS plan.

• Rule 613(a)(1)(ii)

Rule 613(a)(1)(ii) requires the NMS plan to address “[t]he time and method by which the data in the central repository will be made available to regulators, in accordance with [Rule 613(e)(1)] to perform surveillance or analyses, or for other purposes as part of their regulatory and oversight responsibilities.”

The time and method by which data will be made available to regulators are fundamental to the utility of the consolidated audit trail because the purpose of the consolidated audit trail is to assist regulators in fulfilling their responsibilities to oversee the securities markets and market participants.⁷⁷⁵ The NMS plan submitted should discuss these issues in detail, guided, in particular, by the issues and questions raised in the “Regulator Use Cases” described in Section III.C.2.b., below.

The importance of this consideration was discussed in the Proposing Release.⁷⁷⁶ The Commission emphasized the necessity of the data being in a uniform electronic format so that regulators would be able, among other things, to effectively and efficiently detect and investigate illegal trading across markets, without having to spend valuable time and resources reconciling audit trail formatting differences in the data.⁷⁷⁷ In addition, the Proposing Release noted that requiring the order and trade data to be collected in one location in a single format would allow regulators ready access to the data for use in market reconstructions, market analyses, surveillance and investigations,⁷⁷⁸ as regulators could then retrieve the information that they need much faster than the current process of requesting data from multiple parties without having to reconcile disparate audit trail information. Also, in the Proposing Release, the Commission noted the importance of SRO regulatory staff having direct access to consolidated

audit trail data.⁷⁷⁹ The Commission continues to believe that it is vital that regulators have ready access to the consolidated audit trail data in the central repository so that this information can be effectively and efficiently used in fulfilling their regulatory responsibilities.

• Rule 613(a)(1)(iii)

Rule 613(a)(1)(iii) requires the NMS plan to address “[t]he reliability and accuracy of the data reported to and maintained by the central repository throughout its lifecycle, including transmission and receipt from market participants; data extraction, transformation and loading at the central repository; data maintenance and management at the central repository; and data access by regulators.”

The Commission believes the reliability and accuracy of the data is a critical aspect of the consolidated audit trail, because the usefulness of the data to regulators would be significantly impaired if it is unreliable or inaccurate. If the reliability and accuracy of reported data is not maintained by the central repository during the period it is required to be retained and throughout the various uses to which it may be put by regulators, then its value to regulators will be substantially diminished.

Accordingly, the NMS plan submitted should discuss in detail, among other things, how the consolidated audit trail envisioned by the sponsors would be designed, tested, and monitored to ensure the reliability and accuracy of the data collected and maintained by the central repository (e.g., during transmission from the SRO or member to receipt by the central repository,⁷⁸⁰ data extraction, transformation and loading at the central repository,⁷⁸¹ data maintenance and management at the central repository,⁷⁸² and data access by regulators⁷⁸³).

⁷⁷⁹ *Id.* at 32567.

⁷⁸⁰ “Transmission from the SRO or member to receipt by the central repository” refers to the process through which SROs and their members report data to the central repository.

⁷⁸¹ “Data extraction, transformation and loading at the central repository” is the process during which the central repository accepts data reported by the SROs and their members, converts it into a uniform electronic format, if necessary, and receives it into the central repository’s internal systems.

⁷⁸² “Data maintenance and management at the central repository” refers to the process for storing data at the central repository, indexing the data for linkages, searches, and retrieval, dividing the data into logical partitions when necessary to optimize access and retrieval, and the creation and storage of data backups.

⁷⁸³ As noted in Section III.B.1.d.iv., *supra*, for example, regardless of whether the NMS plan elects

⁷⁷³ See Section III.B.2.c., *supra*.

⁷⁷⁴ The Commission notes that another related consideration that must be discussed by the NMS plan includes the alternative approaches to creating the consolidated audit trail that the plan sponsors considered. See Rule 613(a)(1)(xii).

⁷⁷⁵ See Section II.A., *supra*, for additional discussion of the timeliness of access to current audit trail data.

⁷⁷⁶ See Proposing Release, *supra* note 4, at 32564.

⁷⁷⁷ *Id.* at 32564–32565 and 32594. Differences in audit trail data requirements between markets can hinder the ability of regulators to piece together related illegal trading activity occurring across several markets.

⁷⁷⁸ *Id.* at 32594.

The Commission notes that, when proposing Rule 613, it highlighted the importance of this consideration by emphasizing that the reliability and accuracy of the data are critical to the integrity and effectiveness of the consolidated audit trail.⁷⁸⁴ Indeed, Rule 613(e)(4)(ii), like the proposed Rule, specifically requires the plan sponsors to establish policies and procedures for the plan processor to ensure the timeliness, accuracy, and completeness of the audit trail data reported to the central repository.

• *Rule 613(a)(1)(iv)*

Rule 613(a)(1)(iv) requires the NMS plan to discuss “[t]he security and confidentiality of the information reported to the central repository.”

The Commission is including this consideration because it believes that keeping the data secure and confidential is crucial to the efficacy of the consolidated audit trail and the confidence of market participants. Exposure of highly-confidential information about the trading strategies and positions of market participants through a security breach, for example, could impact the confidence of the public in the central repository and in trading on the U.S. markets. The Commission understood the importance of security and confidentiality provisions when it proposed Rule 613(e)(4) to require the NMS plan to include policies and procedures, including standards, to be used by the plan processor to ensure the security and confidentiality of all information reported to, and maintained by, the central repository.⁷⁸⁵ Numerous commenters also noted the importance of maintaining the security and the confidentiality of the data collected pursuant to the proposed Rule.⁷⁸⁶

• *Rule 613(a)(1)(v)*

to use a series of order identifiers or a unique order identifier, it will be very important to demonstrate how the approach selected in the NMS plan will ensure that information about all events pertaining to an order will be reliably and accurately linked together in a manner that allows regulators efficient access to complete order information.

⁷⁸⁴ See Proposing Release, *supra* note 4, at 32582, 32596.

⁷⁸⁵ In addition, proposed Rule 613(e)(4)(i) required plan sponsors, and employees of the plan sponsors and central repository to agree to use appropriate safeguards to ensure the confidentiality of such data, and not to use such data other than for surveillance and regulatory purposes.

⁷⁸⁶ See Scottrade Letter, p. 2; ICI Letter, p. 2–4; Liquidnet Letter, p. 4; Ameritrade Letter, p. 3; Thomson Reuters Letter, p. 4; BATS Letter, p. 3; Managed Funds Association Letter, p. 2–3; Ross Letter, p. 1. The Commission notes that it is adopting Rule 613(e)(4) with modifications—the Commission has added provisions to the Rule to help ensure the confidentiality of the data submitted to and retained by the central repository. See Section III.B.2.e., *supra*.

Rule 613(a)(1)(v) requires the NMS plan to address “[t]he flexibility and scalability of the systems used by the central repository to collect, consolidate and store consolidated audit trail data, including the capacity of the consolidated audit trail to efficiently incorporate, in a cost-effective manner, improvements in technology, additional capacity, additional order data, information about additional securities or transactions, changes in regulatory requirements, and other developments.”

The Commission believes that the flexibility and scalability of the systems used by the central repository are important to the effectiveness of the consolidated audit trail, and, accordingly, the Commission believes the NMS plan under Rule 613 should address potential “built-in” obsolescence that may arise as a result of the SROs’ choice of systems or technology. For this reason, the NMS plan should address how, taking into consideration the costs and benefits, including the potential impact on competition, efficiency, and capital formation, the consolidated audit trail systems might be designed to accommodate: (1) Potential growth in the trading volume or message traffic relating to NMS securities; (2) possible expansion to include other non-NMS securities;⁷⁸⁷ (3) additional data fields that the SROs or the Commission might determine to require in the future (such as new order characteristics); and (4) potential technological developments that might allow the consolidated audit trail to be operated in a more timely, reliable, and cost-effective manner.

As noted in the Commission’s Concept Release on equity market structure,⁷⁸⁸ the market for trading securities has changed dramatically in recent years and, as technology advances, trading systems and trading strategies also change. The Commission

⁷⁸⁷ Rule 613(i) requires the NMS plan to include a provision requiring each SRO to jointly provide to the Commission a document outlining how the consolidated audit trail could be expanded to products other than NMS securities. See also Section III.B.1.a., *supra*. The consideration of flexibility and scalability of the systems requires the SROs to address whether the system proposed in the SRO’s NMS plan submission can accommodate the expansion, while the document required by Rule 613(i) will discuss more broadly how the SROs could incorporate into the consolidated audit trail information with respect to equity securities that are not NMS securities, debt securities, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities, including details for each order and reportable event that may be required to be provided, which market participants may be required to provide the data, an implementation timeline, and a cost estimate.

⁷⁸⁸ See Concept Release on Equity Market Structure, *supra* note 87.

believes that it is important for the consolidated audit trail to keep pace with market developments. It must be designed in a way that allows it to do so efficiently and in a cost-effective manner to assure regulators of its continued usefulness. Thus, the Commission has identified the flexibility and scalability of the systems used by the central repository to collect, consolidate, and store audit trail data as a consideration that must be discussed in the NMS plan submitted to the Commission for its consideration. To sufficiently address this consideration, the Commission expects the NMS plan to describe in detail how the consolidated audit trail envisioned by the sponsors would be designed to accommodate additional message traffic for orders in NMS securities, how readily capacity could be expanded, and the existence of any capacity limits. The Commission also would expect the NMS plan to discuss in detail the extent to which the proposed consolidated audit trail could accommodate potential additional data elements, order characteristics, and other types of securities such as non-NMS securities, debt securities, primary market transactions in equity securities that are non-NMS securities, and primary market transactions in debt securities, how quickly this could be done, and whether any limits exist on the ability of the proposed system to accommodate these types of changes. Additionally, the Commission would expect the NMS plan to further discuss whether and how the consolidated audit trail could be upgraded to keep pace with improvements in technology, such as improvements to the speed of systems processing.

The Commission believes these descriptions are important because, otherwise, what initially appears to be an effective and cost-effective NMS plan could become significantly less so over time as markets evolve and if, for example, order volumes increase, new order types are developed, and additional data elements or other types of securities, such as non-NMS securities, debt securities, primary market transactions in equity securities that are non-NMS securities, and primary market transactions in debt securities, are potentially incorporated into the consolidated audit trail.

The Commission notes that issues relating to the potential flexibility and scalability of the consolidated audit trail were raised in the Proposing Release. For example, the Commission stated that, while the proposal was limited to NMS securities, the Commission ultimately intended the consolidated

audit trail to cover secondary market transactions in other securities and information on primary market transactions.⁷⁸⁹ In fact, as discussed above, the Commission specifically proposed that the NMS plan contain provisions relating to the possible expansion of the consolidated audit trail to products other than NMS securities.⁷⁹⁰ In addition, in the Proposing Release, the Commission specifically noted its concerns with the lack of scalability of the existing EBS system and the fact that the volume of transaction data subject to reporting under the EBS system can be significantly greater than the system was intended to accommodate in a typical request for data.⁷⁹¹

• *Rule 613(a)(1)(vi)*

Rule 613(a)(1)(vi) requires the NMS plan to address “[t]he feasibility, benefits, and costs of broker-dealers reporting to the consolidated audit trail in a timely manner: (A) [t]he identity of all market participants (including broker-dealers and customers) that are allocated NMS securities, directly or indirectly, in a primary market transaction; (B) [t]he number of such securities each such market participant is allocated; and (C) [t]he identity of the broker-dealer making each such allocation.”

In the Proposing Release, the Commission stated that “it would be beneficial to provide for the possible expansion of the consolidated audit trail to include information on primary market transactions in NMS stocks” and required in proposed Rule 613 that the plan sponsors address such expansion in a document provided to the Commission within two months after effectiveness of the NMS plan.⁷⁹² The Commission continues to believe, for the reasons set forth below, that a potential expansion of the consolidated audit trail to cover primary market transactions would be beneficial. Specifically, the Commission believes that the SROs should address—at the time of the submission of the NMS plan to the Commission, rather than as part of a later expansion plan—the feasibility, benefits, and costs of recording and reporting information about allocations of NMS securities in

primary market transactions as part of the consolidated audit trail.

As with the data sources discussed in Section II.A, the sources of information currently available to the Commission regarding allocations of NMS securities in primary market transactions are each limited in their ability to provide accurate, complete, accessible, and timely information.⁷⁹³ For example, while the Commission and FINRA can request information about allocations from the books and records of broker-dealers, such requests are unduly cumbersome for both regulators and market participants, potentially involving multiple time-consuming individual requests.⁷⁹⁴ Other sources of information about allocations of NMS securities in primary market transactions—including public sources⁷⁹⁵—are also limited in certain respects.⁷⁹⁶

In light of these limitations, data about the allocations of NMS securities in primary market transactions could also improve market analysis by the Commission and the SROs, which could in turn help better inform rulemaking and other policy decisions. Specifically, such data might aid the Commission and the SROs in better understanding the role of such allocations in the capital formation process. Combining this data with the secondary market data to be collected by the consolidated audit trail could allow regulators to calculate investor positions and when and how the investors receiving allocations sell their securities. Such data could also facilitate a better understanding of how securities are allocated in a primary

⁷⁹³ See Section II.A. for a discussion of these four qualities.

⁷⁹⁴ See, e.g., Exchange Act Rules 17a–3 and 17a–4 (requiring broker-dealers to make and keep “records of purchases and sales of securities”).

⁷⁹⁵ Regulation S–K requires registrants to provide information related to the number of offered securities that are underwritten by each syndicate member in an effort to describe the nature of the obligation of the syndicate members with respect to the offered securities. See 17 CFR 229.508(a). This information comprises investor-focused disclosures, rather than information that may be needed by regulators for investigative and other purposes, such as the information contemplated by Rule 613(a)(1)(vi).

⁷⁹⁶ For example, FINRA rules require the lead underwriters of an IPO to collect and provide issuers—but not the public, FINRA, or the Commission—with names of institutional investors who received allocations and aggregated information regarding the allocation to retail investors. See FINRA Rule 5131(d).

The Depository Trust Company (“DTC”) also collects information on some IPO allocations in its IPO Tracking System at the discretion of the lead underwriter. See 61 FR 25253 (May 20, 1996). However, as well as being discretionary and therefore only addressing a subset of primary market transactions, the IPO Tracking System only includes allocations to persons with DTC accounts, which generally excludes retail investors.

market transaction, how allocations differ across broker-dealers and investors, and what types of investors are allocated securities. This analysis is virtually infeasible on a market-wide basis today because the data collection process using current sources of information is so cumbersome.

In addition, if the consolidated audit trail included data regarding the allocations of NMS securities in primary market transactions, SROs could be better able to monitor for compliance with their rules related to such transactions.⁷⁹⁷ The data also could more broadly assist SROs in their examinations and investigations related to allocations in initial public offerings (“IPOs”) and other primary market transactions by providing a richer data set for evaluating possible compliance issues. For example, the SROs could use IPO allocation information, combined with the secondary market transaction information in a consolidated audit trail, to run surveillance on whether sales in the IPO auction were marked accurately (*i.e.*, “long” or “short”) and in compliance with applicable requirements.⁷⁹⁸ Allocation data could also allow SROs to conduct surveillance for “red flags” they might develop regarding potential suitability issues related to customer allocations, as well as potentially improper allocations to customers (such as kickbacks).

The Commission could also enhance its own examination and investigation processes if data regarding the allocations of NMS securities in primary market transactions were included in the consolidated audit trail. Without access to a single centralized database of allocations, Commission staff must rely on more limited data sources that generally enable only either broad-based sweeps or one-off investigations based on particularized suspicion of wrongdoing. Because the relevant data would be readily available for analysis, including information about allocations as part of the consolidated audit trail could facilitate the Commission’s identification of particular risks and exam candidates. Other examinations

⁷⁹⁷ See, e.g., FINRA Rules 5130 and 5131. FINRA Rule 5130 imposes certain restrictions on primary market transactions. FINRA Rule 5131 prohibits certain allocation practices such as “spinning,” which refers to an underwriter’s allocation of IPO shares to directors or executives of investment banking clients in exchange for receipt of investment banking business. See Securities Exchange Act Release No. 64521 (May 18, 2011), 76 FR 29808 (May 23, 2011) (Order Approving SR–FINRA–2011–017). Certain “quid pro quo” practices are also addressed by FINRA Rule 5131.

⁷⁹⁸ Currently, SROs must request customer account information during examinations of broker-dealers to check for compliance with order marking rules.

⁷⁸⁹ See Proposing Release, *supra* note 4, at 32568–32569.

⁷⁹⁰ *Id.* at 32569–70.

⁷⁹¹ *Id.* at 32567.

⁷⁹² See Proposing Release, *supra* note 4, at 32569 and 32610. The Commission noted in the Proposing Release that a “primary market transaction is any transaction other than a secondary market transaction and refers to any transaction where a person purchases securities in an offering.” Proposing Release at n. 167.

undertaken by the Commission staff address whether employees of a regulated entity are in compliance with the rules applicable to their transactions related to primary market transactions. Having allocation information available before such an examination commences could allow staff to enhance their pre-examination research, better focus on the sources of potential violations, and ultimately foster more effective and efficient examinations.

In investigations related to primary market transactions, the Commission staff generally must obtain data from underwriters post-transaction, which can take considerable time owing to the limitations on current sources of data noted above.⁷⁹⁹ Including data about the allocations of NMS securities in primary market transactions in the consolidated audit trail could enable investigations to proceed more efficiently and to more quickly assess whether alleged violations of various rules under the Exchange Act, such as Regulation M and Rule 10b-5, warrant investigation.⁸⁰⁰ In addition, the Commission believes that information about allocations could help the SROs and Commission investigate allegations of improper allocations, such as allocations subject to “spinning”⁸⁰¹ or “laddering.”⁸⁰² Currently, these types of investigations would require requesting data from underwriters, and in some cases, other parties (such as investment advisors) involved in the primary market transaction.

Given these potential benefits, the Commission believes that it is important—consistent with its view in the Proposing Release—for the SROs to address the feasibility, benefits, and costs of recording and reporting information about allocations of NMS securities in primary market transactions as part of the consolidated audit trail. However, unlike other potential additions to the consolidated audit trail—e.g., the inclusion of debt securities—that will be contemplated later in expansion plans, allocations of NMS securities in primary market

transactions are uniquely tied to the central element of the NMS plan—the reporting of data regarding trading in NMS securities. For example, allocations in primary market transactions may have a significant impact on trading and other activity in the secondary market, and behavior in the primary market may influence behavior in the secondary market through initial pricing and other mechanisms. More broadly, IPOs and other primary market transactions continue to be a source of particular interest for market participants and observers because of, among other things, their role in the capital formation process. In light of these considerations, the Commission believes it is appropriate to require the SROs to address allocations of NMS securities in primary market transactions at the time that the NMS plan is submitted under adopted Rule 613(a)(1), rather than as part of an expansion plan under adopted Rule 613(i).

At the same time, the Commission recognizes that firms may use systems and methods to handle information regarding allocations of NMS securities in primary market transactions that differ from those used to handle information regarding secondary market transactions in such securities. Such differences may affect the extent to which information regarding allocations may be readily incorporated into the consolidated audit trail described by the NMS plan mandated by Rule 613. For example, the unique features of allocations of NMS securities in primary market transactions may require different reporting timeframes, different information security controls, or additional data elements that would not be required for other information being reported to the central repository and that are not contemplated by Rule 613. Because of these potential differences, the Commission believes it is appropriate to require the SROs to address the feasibility, costs, and benefits of their members reporting information regarding allocations of NMS securities in primary market transactions, rather than require the NMS plan to require such reporting at the outset.

The Commission acknowledges that plan sponsors nevertheless will incur costs to address the feasibility, benefits, and costs of incorporating information about allocations of NMS securities in primary market transactions into the consolidated audit trail. Among other things, the plan sponsors will need to undertake an analysis of technological and computer system acquisitions and

upgrades that would be required to include information about such allocations. However, given the potential benefits described above of including such information in the consolidated audit trail, the Commission believes these costs are justified.

ii. Analysis of the NMS Plan

As noted above, in consideration of the views expressed, suggestions for alternatives, and other information provided by those commenting on the proposed Rule, the Commission is adopting Rule 613 with significant modifications to a number of the proposed requirements. In certain instances these modifications alter the data and collection requirements of the proposed Rule. In other instances, the adopted Rule has been altered to be less prescriptive, and hence less limiting, in the means the SROs may use to meet certain requirements. These modifications significantly expand the solution set that could be considered by the SROs for creating, implementing, and maintaining a consolidated audit trail and thus provide the SROs with increased flexibility in how they choose to meet the requirements of the adopted Rule, relative to the solution set that would have been available under the requirements of the proposed Rule.

Because these modifications permit a wider array of solutions to be considered by the SROs, including solutions that could capitalize on existing systems and standards,⁸⁰³ the assumptions underlying the Commission’s cost estimate in the Proposing Release that new, large-scale market systems would need to be developed from scratch may no longer be valid.⁸⁰⁴ Thus, as part of the multi-step process for developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail, the Commission is deferring its economic analysis of the actual creation, implementation, and maintenance of a consolidated audit trail itself (in contrast to the costs of the actions the SROs are required to take upon approval of the adopted Rule)⁸⁰⁵ until such time

⁸⁰³ See, e.g., FINRA Letter, p. 14; SIFMA Letter, p. 16–18.

⁸⁰⁴ The methodology in the Proposing Release assumed that the scope of the required systems changes would be comparable to those made in connection with Regulation NMS. See Proposing Release, *supra* note 4, at 32597 n. 352. See also Section I, *supra*.

⁸⁰⁵ These actions include the requirement that the SROs develop an NMS plan, utilizing their own resources and undertaking their own research that

Continued

⁷⁹⁹ This approach also may unduly burden the lead underwriter as the “gatekeeper” of such information and prevents the Commission and SROs from pursuing investigative techniques that may rely on reaching out to individual market participants for preliminary information without using the underwriter.

⁸⁰⁰ See note 242, *supra*.

⁸⁰¹ See note 795, *supra*.

⁸⁰² “Laddering” is a practice that generally refers to inducing investors to give orders to purchase shares in the aftermarket at particular prices in exchange for receiving IPO allocations. See NYSE/NASD IPO Advisory Committee report and Recommendations (May 2003), at 6, available at <http://www.finra.org/web/groups/industry/@ip/@reg/@guide/documents/industry/p010373.pdf>.

as it may approve any NMS plan submitted to the Commission for its consideration—that is, after the NMS plan, together with its detailed information, including cost estimates for the creation, implementation, and maintenance of the consolidated audit trail, and analysis, has been submitted by the SROs to the Commission and there has been an opportunity for public comment. The Commission believes that the information and analyses will help inform public comment regarding the NMS plan and will help inform the Commission as it evaluates whether to approve the NMS plan. In this way, the Commission can be better informed about the costs for the development, implementation, and maintenance of the consolidated audit trail that benefit from cost data and information provided by the SROs in conjunction with—and guided by—their development of an NMS plan that complies with the requirements of the adopted Rule. In addition, as noted above,⁸⁰⁶ the Rule includes a mandate that in determining whether to approve the plan and whether the plan is in the public interest, the Commission must consider the impact of the NMS plan on efficiency, competition, and capital formation.

• *Rule 613(a)(1)(vii)*

Rule 613(a)(1)(vii) requires the NMS plan to include “[t]he detailed estimated costs for creating, implementing, and maintaining the consolidated audit trail as contemplated by the national market system plan, which estimated costs should specify: (A) [a]n estimate of the costs to the plan sponsors for creating and maintaining the central repository; (B) [a]n estimate of the costs to members of the plan sponsors, initially and on an ongoing basis, for reporting the data required by the national market system plan; (C) [a]n estimate of the costs to the plan sponsors, initially and on an ongoing basis, for reporting the data required by the national market system plan; and (D) [h]ow the plan sponsors propose to fund the creation, implementation, and maintenance of the consolidated audit trail, including the proposed allocation of such estimated costs among the plan sponsors, and between the plan sponsors and members of the plan sponsors.”⁸⁰⁷

Commenters opined on the costs of funding the consolidated audit trail in general.⁸⁰⁸ One commenter stated that

addresses the specific details, cost estimates, considerations, and other requirements of the Rule.

⁸⁰⁶ See Section I., *supra*.

⁸⁰⁷ See Rule 613(a)(1)(vii).

⁸⁰⁸ See Wells Fargo Letter, p. 4; SIFMA Letter, p. 22.

the Commission should give “important consideration to alternative means to help fund the creation of what is essentially a public utility in [the consolidated audit trail],” suggesting the Commission “should itself pay user fees to help build and run the [consolidated audit trail],” or that the government should underwrite low-cost loans for market participants aimed to pay the costs of the consolidated audit trail.⁸⁰⁹ Another commenter suggested that the cost of creating and maintaining the central repository should be shared among all market participants, including broker-dealers, ATSS, and exchanges.⁸¹⁰ Another commenter stated that, if the Commission requires the SROs to fund the creation of the consolidated audit trail (*i.e.*, the central repository), SROs may be forced to raise transaction fees, which would “resurrect the distortions caused by high transaction fees, potentially increase the use of flash orders, if allowed, and discourage trading activity.”⁸¹¹

The Commission also received comments regarding the allocation of the costs of the consolidated audit trail.⁸¹² One commenter emphasized that the NMS plan must provide for an equitable allocation of costs, including the sharing of expansion costs by the parties that benefit from any new products added to the consolidated audit trail.⁸¹³ One commenter suggested that the Commission should require trading venues to allocate system costs for the consolidated audit trail “at least partially based on message traffic * * *.”⁸¹⁴ Similarly, another commenter, opining that exchanges currently bear a disproportionate amount of the costs for market surveillance and noting that exchanges would also be forced to shoulder the costs of the consolidated audit trail, suggested that other venues, such as ATSS and internal broker-dealer platforms, should bear a proportionate share of the costs of creating, implementing, and maintaining the consolidated audit trail.⁸¹⁵ This commenter also suggested that the Commission fund the audit trail using fees assessed on high frequency traders who cancel a “disproportionately high” percentage of their orders,⁸¹⁶ arguing that this “would have the added benefit

⁸⁰⁹ See Wells Fargo Letter, p. 4.

⁸¹⁰ See Liquidnet Letter, p. 9.

⁸¹¹ See SIFMA Letter, p. 22.

⁸¹² See Nasdaq Letter I, p. 13–14; BOX Letter, p. 3; Liquidnet Letter, p. 9; Kaufman Letter, attachment p. 3.

⁸¹³ See Nasdaq Letter I, p. 13–14.

⁸¹⁴ See Kaufman Letter, attachment p. 3.

⁸¹⁵ See Schumer Letter, p. 1.

⁸¹⁶ *Id.* at p. 1–2.

of deterring a practice that, at best, adds little value in the price discovery process and, at worst, is potentially manipulative or even fraudulent.”⁸¹⁷

The Commission believes that the issues surrounding how the consolidated audit trail should be funded, and how costs in creating, implementing, and maintaining the consolidated audit trail should be allocated, are important, and the Rule requires information about those issues to be provided by the SROs in the NMS plan submitted to the Commission for its consideration. In response to comments and in recognition that an initiative of the size and scope of the consolidated audit trail necessarily will require substantial expenditures by the SROs and their members, the Commission is requiring, pursuant to Rule 613(a)(1)(vii), the SROs to include in the NMS plan, a discussion of costs and how such costs will be allocated. As discussed above, the Commission believes that the SROs will incur costs to create and maintain the central repository.⁸¹⁸ Also, as discussed above, SROs and their members may need to make systems changes or to purchase new systems to record and report the data required by the NMS plan to the central repository.⁸¹⁹ SROs and their members will incur upfront costs, as well as ongoing costs to record and report such information. Because, as noted above, these costs can only be analyzed once the SROs narrow the array of choices they have and develop a detailed NMS plan,⁸²⁰ the Commission believes that the most robust approach for estimating these costs is for the SROs to provide such cost estimates in conjunction with, and guided by, their development of the NMS plan. The Commission believes that a fulsome discussion in the NMS plan of the estimated costs to SROs and their members will aid commenters in providing useful comments that will further the Commission’s understanding of the cost implications of the consolidated audit trail. In addition, a fulsome discussion will aid the Commission in its evaluation of whether to approve the NMS plan and in conducting its own analysis of the costs and benefits of the NMS plan.

There also would be costs associated with establishing and operating the central repository that will be jointly owned by the plan sponsors. The Commission believes it is important to understand how the plan sponsors plan

⁸¹⁷ *Id.* at p. 2.

⁸¹⁸ See Section III.B.2., *supra*.

⁸¹⁹ See Section III.B.1., *supra*.

⁸²⁰ See Section I., *supra*.

to allocate such costs among themselves to help inform the Commission's decision regarding the possible economic or competitive impact of the NMS plan amongst the SROs. In addition, although the plan sponsors likely would initially incur the costs to establish and fund the central repository directly, they may seek to recover some or all of these costs from their members. If the plan sponsors seek to recover costs from their members, the Commission believes that it is important to understand the plan sponsors' plans to allocate costs between themselves and their members, to help inform the Commission's decision regarding the possible economic or competitive impact of the NMS plan.

• *Rule 613(a)(1)(viii)*

Rule 613(a)(1)(viii) requires the NMS plan to include “[a]n analysis of the impact on competition, efficiency, and capital formation of creating, implementing, and maintaining the national market system plan.”

Rule 608(a)(4)(ii)(C) under Regulation NMS already requires every NMS plan submitted to the Commission to be accompanied by an analysis of the impact on competition of implementation of the plan.⁸²¹ This requirement is designed to help inform the Commission's evaluation of whether the NMS plan will impose a burden on competition that is not necessary or appropriate in furtherance of the purposes of the Exchange Act. The Rule re-states the application of the Rule 608(a)(4)(ii)(C) requirement to provide an analysis of the NMS plan's impact on competition and imposes a requirement that the NMS plan also include an analysis of the impact on efficiency and capital formation.⁸²²

These requirements are designed to help inform the Commission's understanding of whether the NMS plan may promote efficiency and capital formation. As an initial matter, the SROs will be providing an analysis of the economic consequences of the NMS plan they develop and propose. As noted above, because the specific requirements of the NMS plan will not be known until the NMS plan is submitted, and the SROs will be providing that analysis, the Commission will consider the impact of the proposed consolidated audit trail on efficiency, competition, and capital formation in deciding whether to approve the NMS plan. The Commission, however, will consider such analysis in determining whether to approve the NMS plan and

whether the plan is in the public interest under Rule 608(b)(2).⁸²³

iii. Process Followed To Develop the NMS Plan

The following two considerations require the NMS plan to address how the SROs solicited the input of their members and other appropriate parties in their design of the NMS plan, and to detail the alternative consolidated audit trail designs considered and rejected by the SROs. These considerations will inform the Commission's evaluation of the NMS plan submitted for its consideration.

• *Rule 613(a)(1)(xi)*

Rule 613(a)(1)(xi) requires the NMS plan to discuss “[t]he process by which the plan sponsors solicited views of their members and other appropriate parties regarding the creation, implementation, and maintenance of the consolidated audit trail, a summary of the views of such members and other parties, and how the plan sponsors took such views into account in preparing the national market system plan.”

The Commission believes that the SROs' consideration of the views of their members is important because, given the scope of the Rule, it will affect many market participants and will require them to report a broad range of audit trail information. Ensuring that market participants with varied perspectives have a role in developing the NMS plan submitted to the Commission for its consideration could help inform the plan sponsors of operational or technical issues that may arise in the implementation of the NMS plan, and help assure the Commission and market participants that the requirements imposed on members are done so in an efficient and cost-effective manner.⁸²⁴ Similarly, the Commission believes it is important that the SROs consider the views of other parties—such as back office service providers, market operations specialists, and technology and data firms—as may be appropriate in light of the Rule's goal of creating, implementing, and maintaining a complex system that may entail changes to multiple other systems and functionalities involved across the lifecycle of an order. Such parties could offer operational and technical expertise to the SROs, including, among other things, by identifying issues that may arise in the interface between legacy and new systems. In addition, the inclusion of such parties in the deliberative

process could also result in the introduction of additional alternative approaches.

The Commission also believes that it is appropriate to require the SROs to set out in the NMS plan a summary of the views expressed by such members and other parties and how the SROs took those views into account in developing the NMS plan. This requirement is designed to inform the Commission about the extent to which the SROs considered the views of their members and other appropriate parties as they undertook the complex task of developing the NMS plan for a consolidated audit trail, to facilitate a cost estimate by the SROs that takes into account the costs members will incur in creating, implementing, and maintaining the consolidated audit trail, as well as to encourage the consideration of reasonable alternative approaches contemplated by Rule 613(a)(1)(xii) in the plan formulation process.

The Commission received several comments advocating inclusion of the broker-dealer community and other appropriate parties in the planning of the consolidated audit trail.⁸²⁵ One commenter, with respect to NMS plan governance, urged the inclusion of “an official ‘seat at the table’ alongside the SROs” for members of the broker-dealer industry.⁸²⁶ Another commenter recommended that the Commission seek greater SRO and broker-dealer involvement in the front-end planning before adopting a final rule to make all parties aware of potential design tradeoffs, and establish appropriate timelines for implementation and compliance.⁸²⁷ A further commenter advocated allowing working groups to engage in dialogue with the Commission, broker-dealers and the SROs to effectively conduct the business analysis needed to build the consolidated audit trail.⁸²⁸ Additionally, one commenter suggested that the Commission staff should form and engage working groups comprised of representatives from the “affected constituents,” specifically brokers and “key technology vendors,”⁸²⁹ and that such working groups could work with the Commission to develop a request for proposal.⁸³⁰ Similarly, another commenter urged the Commission to require an industry working group of

⁸²⁵ See FIF Letter II, p. 2; SIFMA February 2012 Letter, p. 1; STA Letter, p. 1–2.

⁸²⁶ See SIFMA February 2012 Letter, p. 1.

⁸²⁷ See Broadridge Letter, p. 2.

⁸²⁸ See FIF Letter II, p. 2, STA Letter, p. 1–2.

⁸²⁹ See Direct Edge Letter, p. 2.

⁸³⁰ See Direct Edge Letter, p. 2.

⁸²³ See Rule 613(a)(5).

⁸²⁴ See Section II.C.3., *supra*, for a summary of comments suggesting wider involvement in the development of the consolidated audit trail.

⁸²¹ See 17 CFR 242.608(a)(4)(ii)(C).

⁸²² See Rule 613(a)(1)(viii).

SROs and a representative group of broker-dealers to address the “complexities involved in developing such a system.”⁸³¹ One commenter suggested encouraging the participation of issuers and other market participants in the creation of the consolidated audit trail,⁸³² and another commenter advocated the inclusion of “broad industry participation from the SEC, FINRA, exchange, broker dealer and vendor communities.”⁸³³

The Commission considered the comments recommending wider industry involvement in the creation of the consolidated audit trail and believes that, since the consolidated audit trail will be a regulatory tool used by the SROs and the Commission, it is appropriate for the SROs, when developing the NMS plan, to request input from the securities industry as well as technological advice. The Commission believes that this input should be sought during the preparation of the NMS plan submitted to the Commission for its consideration,⁸³⁴ during the comment process,⁸³⁵ and subsequent to the approval of an NMS plan.⁸³⁶

- *Rule 613(a)(1)(xii)*

Rule 613(a)(1)(xii) requires the NMS plan to discuss “[a]ny reasonable alternative approaches to creating a consolidated audit trail that the plan sponsors considered in developing the national market system plan, including, but not limited to, a description of any such alternative approach; the relative advantages and disadvantages of each such alternative, including an assessment of the alternative’s costs and benefits; and the basis upon which the plan sponsors selected the approach reflected in the national market system

⁸³¹ See Ameritrade Letter, p. 2.

⁸³² See IAG Letter, p. 3 (also recommending that the consolidated audit trail, in general, should involve a reduction in its size and scope, as well as a review of the capabilities of existing systems).

⁸³³ See FIF Letter II, p. 1–3. See also STA Letter, p. 1–3 (recommending the same, but with the inclusion of the investor community and institutional asset managers).

⁸³⁴ See also Rules 613(a)(1)(vii)(A) and (D), respectively requiring “[a]n estimate of the costs to the plan sponsors for establishing and maintaining the central repository” and an explanation of “[h]ow the plan sponsors propose to fund the creation, implementation, and maintenance of the consolidated audit trail, including the proposed allocation of such estimated costs among the plan sponsors, and between the plan sponsors and members of the plan sponsors.”

⁸³⁵ The Commission notes that any NMS plan submitted and any amendment to the plan would be subject to notice and public comment, during which members of the industry and other interested persons may provide comments on the NMS plan. 17 CFR 242.608(b)(1).

⁸³⁶ See Rule 613(b)(7). See also Section III.B.3.b., *supra*.

plan.”⁸³⁷ The Commission believes this consideration is appropriate because it reflects the view, supported by commenters, that there are alternative approaches to creating, implementing, and maintaining the consolidated audit trail. The Commission believes that requiring the SROs to discuss alternatives considered helps ensure that the plan sponsors have appropriately weighed the merits of the various approaches that might be considered to create, implement, and maintain the consolidated audit trail, by requiring the NMS plan to describe the alternatives that the plan sponsors considered before making any significant decision with respect to the consolidated audit trail, and the relative advantages and disadvantages, including costs and benefits, of such alternatives. The Commission also believes that requiring transparency with respect to alternative approaches and the decisionmaking process of the SROs will facilitate public comment on the NMS plan and the wisdom of the approach selected by the plan sponsors. Similarly, such transparency should provide the Commission with useful insights into the rationale for the approach chosen by the plan sponsors as it considers whether to approve the NMS plan submitted to the Commission. The Commission also notes that this consideration complements Rule 613(a)(1)(vii), discussed above, which requires that the NMS plan discuss the detailed estimated costs to the plan sponsors for creating, implementing, and maintaining the consolidated audit trail, because this consideration requires the NMS plan to provide the costs of the alternatives that were not adopted by the plan sponsors in the NMS plan submitted to the Commission.

iv. Implementation and Milestones of the Consolidated Audit Trail

The following two considerations are designed to elicit additional information from the plan sponsors about the implementation and milestones of the consolidated audit trail. These will inform the Commission’s evaluation of the NMS plan submitted to the Commission for its consideration, particularly in the degree to which the consolidated audit trail can replace existing data sources and in how effectively the proposed plan will meet the objectives discussed in Section II.B.2.

- *Rule 613(a)(1)(ix)*

⁸³⁷ See Rule 613(a)(1)(xii).

Rule 613(a)(1)(ix) requires the NMS plan to discuss “[a] plan to eliminate existing rules and systems (or components thereof) that will be rendered duplicative by the consolidated audit trail, including identification of such rules and systems (or components thereof); to the extent that any existing rules or systems related to monitoring quotes, orders, and executions provide information that is not rendered duplicative by the consolidated audit trail, an analysis of: (A) [w]hether collection of such information remains appropriate; (B) [i]f still appropriate, whether such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail; and (C) [i]f no longer appropriate, how the collection of such information could be efficiently terminated; the steps the plan sponsors propose to take to seek Commission approval for the elimination of such rules and systems (or components thereof); and a timetable for such elimination, including a description of the phasing-in of the consolidated audit trail and phasing-out of such existing rules and systems (or components thereof).”⁸³⁸

As noted in the Proposing Release and above, many exchanges and FINRA each have their own disparate audit trail rules.⁸³⁹ Thus, a member of the various exchanges and FINRA could be subject to the audit trail rules of, and be required to submit different information to, more than one exchange and FINRA. In addition, several commenters discussed the potential reduction in costs for the creation, implementation, and maintenance of a consolidated audit trail if existing SRO audit trail requirements were eliminated. In particular, one commenter stated that, “over the long-term, the costs of developing a carefully designed and appropriately scaled consolidated audit trail could be offset in part by eliminating the individual SRO reporting requirements imposed under existing audit trail systems.”⁸⁴⁰ This commenter also urged the SROs and the Commission “to rely to the fullest extent possible on the consolidated audit trail data for market reconstructions, investigations, and analysis, rather than requesting data from broker-dealers. This would be more efficient for both firms and regulators and would help maximize the utility of the consolidated audit trail.”⁸⁴¹

⁸³⁸ See Rule 613(a)(1)(ix).

⁸³⁹ See Proposing Release, *supra* note 4, at 32595.

⁸⁴⁰ See SIFMA Letter, p. 2.

⁸⁴¹ *Id.*

Another commenter similarly stated that “a consolidated trail and consolidated market surveillance should achieve economies of scale that ultimately lower costs for both the markets themselves and the market participants.”⁸⁴² This commenter further reasoned that, “[r]ather than each SRO separately maintaining its own surveillance staff and surveillance programs that are searching for the same behavior, and thus creating redundancies, certain technology and staff resources can be consolidated into a single enterprise with costs equitably allocated across all SROs.”⁸⁴³ However, the commenter also pointed out that “[s]uch consolidation, of course, would not preclude individual SROs from conducting surveillance for unique attributes and rules of its marketplace, ensuring that specialized market expertise continues to inform surveillance and oversight of trading on that market.”⁸⁴⁴

Many other commenters shared similar opinions with regards to the efficiency effects that a consolidated audit trail would have on market participants and their requirements to provide data to regulators. One commenter, for example, listed as one of seven benefits of a consolidated audit trail that “it would reduce the time and resources required by market participants to respond to case-by-case requests from regulators.”⁸⁴⁵ Another commenter stated that it “agrees with the Commission that the implementation of the proposed consolidated audit trail would likely render unnecessary existing audit trails and data obtained through the equity blue sheets system.”⁸⁴⁶ Similarly, another commenter also “agree[d] with the Commission that in calculating the total cost to the industry of the audit trail it is important to consider offsetting savings from the retirement of redundant data feeds such as OATS, OTS, COATS, ISG Equity Audit Trail, and EBS. In addition, the industry may be able to avoid the cost of compliance with the Commission’s proposed Large Trader Reporting System if the consolidated audit trail contains sufficient information to meet those requirements.”⁸⁴⁷

The Commission recognizes that the creation of a consolidated audit trail could result in efficiency gains for market participants with respect to their regulatory data reporting requirements and for regulators with respect to their surveillance activities. The Commission also recognizes that the consolidated audit trail could render existing rules and systems that contain the same requirements as the consolidated audit trail redundant. While the Commission is not at this time requiring that existing rules and systems be eliminated, the Rule requires that the NMS plan provide a plan to eliminate existing rules and systems (or components thereof), including identification of such rules and systems (or components thereof). Further, to the extent that any existing rules or systems related to monitoring quotes, orders, and executions provide information that is not rendered duplicative by the consolidated audit trail, such plan must also include an analysis of (1) whether the collection of such information remains appropriate, (2) if still appropriate, whether such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail, and (3) if no longer appropriate, how the collection of such information could be efficiently terminated. Finally, such plan must also provide the steps the plan sponsors propose to take to seek Commission approval for the elimination of such rules and systems (or components thereof); and a timetable for such elimination, including a description of how the plan sponsors propose to phase in the consolidated audit trail and phase out such existing rules and systems (or components thereof).

The Commission believes that the implementation of a plan to eliminate duplicative existing rules, systems, and/or components of such rules and systems, will result in increased efficiency to market participants who need to comply with the disparate reporting requirements for orders and with repeated requests for data by regulators who cannot obtain the data they need from existing sources of information.

- *Rule 613(a)(1)(x)*

Rule 613(a)(1)(x) requires the NMS plan to include “[o]bjective milestones to assess progress toward the implementation of the national market system plan.”

The creation of a consolidated audit trail is crucial to the effective oversight of the U.S. securities markets, but at the same time is an initiative of substantial scope and complexity. Accordingly, to

ensure that the consolidated audit trail is established in a timely and logical manner, and that the SROs can be held accountable for maintaining a workable implementation schedule, the NMS plan submitted is required to set forth a series of detailed objective milestones, with projected completion dates, toward implementation of the consolidated audit trail. In addition to being useful for the Commission in its evaluation of the NMS plan, the milestones will be used by the Commission in its supervision of the implementation of the consolidated audit trail. Such milestones could include, but are not limited to: publication and implementation of the methods for obtaining a CAT-Reporter-ID and the Customer-ID database, testing of the collection of order and execution data from a representative subset of broker-dealers, initial access to the central repository for regulators, demonstration of linking the full lifecycle of events for select test orders, cancels, modifications, and executions, and integration of trade and quote data as currently reported by trading venues into the central repository.

- v. Commission Review

The Commission believes these considerations represent fundamental characteristics of a meaningful plan to establish an effective and efficient consolidated audit trail. The Commission will assess the NMS plan’s discussion of the considerations described as part of its evaluation of the NMS plan.⁸⁴⁸ The Commission notes that, if the NMS plan submitted does not comply with the requirements of the Rule, or if the Commission determines changes are necessary or appropriate, the Commission may amend the NMS plan pursuant to Rule 608(b)(2) of Regulation NMS with such changes or subject to such conditions as the Commission may deem necessary or appropriate, taking into account the considerations contemplated in Rule 613(a)(1).⁸⁴⁹ In addition, should the NMS plan and the consolidated audit trail not keep pace with market or technological developments, such that its efficiency or effectiveness becomes

⁸⁴⁸ To further facilitate this review, the Commission expects that the plan sponsors would keep minutes of their meetings to formulate the NMS plan, and that such minutes would be readily reviewable by the Commission.

⁸⁴⁹ 17 CFR 242.608(b)(2). To approve such a plan, the Commission must find that such plan or amendment is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Act.

⁸⁴² See FINRA Letter, p. 2.

⁸⁴³ *Id.* at p. 2-3.

⁸⁴⁴ See FINRA/NYSE Euronext Letter, p. 4.

⁸⁴⁵ See Liquidnet Letter, p. 1.

⁸⁴⁶ See BATS Letter, p. 4. See also FIA Letter, p. 1; FIF Letter II, p. 2.

⁸⁴⁷ See Nasdaq Letter I, p. 11. The Commission notes that this comment letter was submitted prior to the adoption of the Large Trader Reporting Rule. See note 1, *supra*, and accompanying text.

impaired,⁸⁵⁰ the Commission itself may, pursuant to Rule 608(b), propose an amendment to the NMS plan.⁸⁵¹

b. Regulator Use Cases

In light of the comments recommending that the Commission undertake an RFP process and provide more “business requirements”⁸⁵² the Commission believes that it is useful to provide further details about how it envisions regulators would use, access, and analyze consolidated audit trail data through a number of “use cases,” as might typically be found in an RFP. These “use cases” and accompanying questions set forth below are derived directly from the considerations described in adopted Rule 613(a)(1), which, as discussed in Section III.C.2.a., originated from key principles of the consolidated audit trail that had been highlighted by the Commission in the Proposing Release. Specifically, these “use cases” describe the various ways in which, and purposes for which, regulators would likely use, access, and analyze consolidated audit trail data. By describing how regulators would use the consolidated audit trail data, the “use cases” and the related questions are meant to elicit a level of detail about the considerations that should help the SROs prepare an NMS plan that better addresses the requirements of the adopted Rule. They should also aid the Commission and the public in gauging how well the NMS plan will address the need for a consolidated audit trail. In particular, the “use cases” will assist in gauging how well the NMS plan will specifically address the needs outlined in this Rule, by describing the features, functions, costs, benefits, and implementation times of the plan.

The Commission notes that it is not including these “use cases” and accompanying questions to endorse a

particular technology or approach to the consolidated audit trail; rather, these “use cases” and accompanying questions are designed to aid the SROs’ understanding of the types of useful specific information that the NMS plan could contain that would assist the Commission in its evaluation of the NMS plan. The Commission also notes that its description of “use cases” includes a non-exclusive list of factors that SROs could consider when developing the NMS plan. The SROs also may include in the NMS plan submitted to the Commission for its consideration any other information regarding how data would be stored or accessed that the SROs believe the Commission or the public may find useful in evaluating the NMS plan submitted.

1. Analyses Related to Investigations and Examinations

The Commission expects that the consolidated audit trail will provide regulators the ability to more efficiently conduct targeted investigations and examinations. These generally require being able to conduct several types of queries on large amounts of data and extract targeted segments of such data. These targeted segments are likely to be much smaller than the bulk extractions discussed in Section III.C.2.b.2., below.

Off-Line Analysis. Regulators are likely to frequently require the extraction of relatively small amounts of select data from the consolidated audit trail database at the central repository for their own “off-line” analyses.⁸⁵³ For example, a regulator may need to extract data on all orders in a particular stock, by a particular customer, on a particular day, or based on any other combination of fixed search criteria.⁸⁵⁴ Though the total data extracted may be small, the number of records that need to be searched to find such data may be enormous.

i. What technical or procedural mechanisms will regulators be required to use to request data extractions? Does

⁸⁵³ For purposes of these use-cases, an “off-line” analysis is defined to be any analysis performed by a regulator based on data that is extracted from the consolidated audit trail database, but that uses the regulator’s own analytical tools, software, and hardware.

⁸⁵⁴ Fixed search criteria are those that are based on specific pre-defined data elements that are stored in the consolidated audit trail database. In contrast, dynamic search criteria are those that are based on numerical levels, thresholds, or other combinations of mathematical formula or logic that would require some amount of additional calculations to be performed on, and derived from, pre-defined data elements already stored in the database to complete the search operation and return to the user the data that meets the requested criteria.

the NMS plan provide for a front-end user interface to perform search and extractions? If not, what types of tools or technologies would regulators need to implement to send search and extract requests to the database? Would regulators be permitted to write and submit their own queries (e.g., Structure Query Language or “SQL”) to the database directly? Would the central repository write and submit queries on behalf of a regulator at the regulator’s request?

ii. What response times should regulators expect from search and extract requests? Would a search for all trades in a given security by a given customer over a specified period of time return a response with all requested data in one minute? One hour? Overnight? How would this response time scale with the amount of data requested? With the amount of data being searched?

iii. How would the database effectively process simultaneous requests by multiple users at one or more regulators? Will each request be queued serially? Can they be processed in parallel? What is the effect of simultaneous requests on response times? Would there be limits to the number of search queries that can be performed at the same time? Would there be limitations on the size of the extractions from such queries?

iv. A wide range of users at regulators may need to search and extract data for analysis. How are users to be administered? If the NMS plan contemplates a front-end user interface, what validation and security mechanisms will ensure that only permitted users will have access to such data? If the plan contemplates direct access through a means other than a front-end user interface, what security and validation mechanisms would regulators need to deploy to interact with the database?

Dynamic Search and Extraction. At times, regulators may need to identify and extract small amounts of data from the database based on dynamic search criteria that might require the database to perform calculations on stored data to meet the specified criteria. A few examples of dynamic criteria are: searching for trades with trade sizes above a certain threshold, searching for trades in securities with execution prices that change more than a certain percentage in a given period of time, and searching for orders that are canceled within a certain period of time.

i. Does the NMS plan contemplate allowing for dynamic search criteria to operate directly on the database? If so, how would the dynamic search criteria

⁸⁵⁰ See Rules 613(a)(1)(v), (b)(6), (d)(2). See also Sections III.B. and III.C.2.a.i., *supra* (discussing the consideration of flexibility and scalability of the systems used by the central repository; the requirement that the NMS plan require the plan sponsors to provide a written assessment with an evaluation of, and a detailed plan to improve, the performance of the consolidated audit trail at least every two years; and the requirement to annually evaluate the clock synchronization and time stamp standards).

⁸⁵¹ 17 CFR 242.608(a)(2). For example, if the requirements of the plan are not amended after the annual evaluation of the clock synchronization and time stamp standards to be consistent with changes in the industry standards, the Commission has the authority and means to propose an amendment to those requirements of the plan. The Commission can approve an amendment to an effective national market system plan that was initiated by the Commission, by rule. 17 CFR 242.608(b)(2).

⁸⁵² See FIF Letter, p. 1, 9; FIF Letter II, p. 1–2; Direct Edge Letter, p. 2–3, 5; Section III.C.1.a., *supra*.

be specified and run? What, if any, limitations would there be on the types of search criteria that can be requested? What are the implications for response times? If the plan contemplates a front-end user interface, will dynamic search criteria be included? If the plan allows for dynamic search criteria through a means other than a front-end user interface, what types of tools or technologies would regulators need to implement to request dynamic searches? Have the plan sponsors considered whether such tools or technologies and the personnel to use them are currently available to the regulators?

ii. If the NMS plan does not contemplate dynamic search criteria, please explain how regulators would be able to use the consolidated audit trail data to perform such searches. Would data need to be downloaded in bulk by the regulators to accomplish these types of searches off-line (see below for related questions)?

2. Analyses Related to Monitoring, Surveillance, and Reconstruction

In addition to targeted analysis of select data from the consolidated audit trail database, regulators will also require the analysis of data in bulk form. For example, the Commission is likely to use consolidated audit trail data to calculate detailed statistics on order flow, order sizes, market depth and rates of cancellation, to monitor trends and inform SRO and Commission rulemaking. To satisfy the surveillance requirements of Rule 613(f), regulators may want the ability to feed consolidated audit trail data into analytical “alert” programs designed to screen for potential illegal activities such as insider trading or spoofing. Surveillances might also benefit if regulators are able to link consolidated audit trail data with databases on certain types of material news events or market participants. This would allow regulators to isolate and aggregate data on trading in advance of those news events or by those participants. If preliminary analyses showed problems, the regulators could then request significant amounts of data for a more thorough and detailed follow-up analysis. In the event of a large scale market event like the May 6, 2010 “flash crash,” regulators are likely to use consolidated audit trail data to reconstruct market events on the day of the event, including but not limited to reconstructing entire order books and trading sequences.

i. What, if any, SRO surveillance data could be replaced by the consolidated audit trail while still improving SROs’ ability to surveil?

ii. How will the NMS plan allow regulators to address these types of large-scale, on-going data analyses?

iii. In addition to providing regulators with the ability to search and extract data, will the NMS plan provide regulators with access to any plan-hosted applications or interfaces (*i.e.*, those that operate on plan-based systems and resources) that would enable users to perform data analyses on, or create reports or graphs from, data stored in the database (such application or interfaces collectively known as “hosted analytical tools”)? If so, how would regulators use and access such tools? What are the limitations of such tools? Would the tools allow regulators to perform the analyses discussed in the examples presented above?

iv. If the NMS plan does not provide regulators with hosted analytical tools, how would regulators be expected to use their own resources, software, and hardware to perform such analyses? Would the plan provide regulators with an application programming interface (“API”) that allows regulators to develop their own tools that interact directly with the consolidated audit trail database? If so, what will the form of such API be? Are there limitations to the number of systems that could connect to the database? How will the plan negotiate priorities for connectivity, searches and queries done via the API? Will there be limitations to the types of queries that could be performed through the API? What types of in-house technologies and systems would be required for regulators to connect to the consolidated audit trail in this fashion?

v. If the NMS plan does not provide regulators with analytical tools and services and does not provide an API for regulators to connect their own analytics systems to the database, what mechanism would the plan provide to regulators for accessing bulk data in a way that allows for large-scale analyses? Would the plan allow for end-of-day downloads of an entire day’s activity so that regulators could load this information into their own systems for such analysis? If so, how is access to such a download to be controlled and implemented? How long would it take to transmit an entire day’s worth of consolidated audit trail data to each of the regulators that requires such access? 10 minutes? One hour? Multiple hours? Longer than overnight? Do these time estimates reflect that multiple regulators are likely to simultaneously download consolidated audit trail data each night? What types of technologies or systems would be required for regulators to download this data? What are the expected sizes of such a data download?

What type of systems would each regulator need to deploy to store and analyze this data? Have the plan sponsors considered whether such systems and the personnel to operate them are currently available to the regulators?

vi. Does the plan contemplate data streaming as a method of transmitting bulk data to each regulator? If so, what is the form and mechanism of such data streaming? Would the streaming occur intraday as data is reported to, and processed by, the database, or would the streaming occur after all (or a majority of, or such other criteria) data was reported to, and processed by the database (*e.g.* overnight streaming)? How would intraday streaming impact the accuracy or completeness of the data received by regulators? Would data be transmitted through different methods or with varying delays by different SROs?

vii. If the plan does not contemplate any bulk data analyses or means of transmitting data to regulators on a bulk overnight basis or in an intraday or overnight streaming fashion, describe what alternative mechanisms, if any, could be used to enable regulators to perform the types of analyses described at the beginning of the section (b), as well as the various examples described throughout this document of how regulators would make use of consolidated audit trail data.

3. Order Tracking and Time Sequencing

As discussed in detail throughout this Release, one of the key requirements of the consolidated audit trail is to provide regulators with a complete record of all of the events that stem from a particular order, from routing to modification, cancellation, or execution. In addition, these events must be stored by the central repository in a linked manner—using either a unique order identifier or a series of unique order identifiers, as discussed in Section III.B.1.d.iv.—so that regulators can quickly and accurately extract a time-sequenced history of each event related to an order.

i. What methods will the plan use to create the linkages for order events as described above? How will regulators access and search on data in a linked fashion?

ii. What is the technical form of the order identifier(s) that broker-dealers will be required to send to the consolidated audit trail database so that these linkages can be created? To what extent will broker-dealers be able to generate such identifier(s) using their current systems? To what extent will broker-dealers need to collect or track

new data, or modify their systems, to generate such identifier(s)?

iii. Will the transmission of economic data (such as a price) be sent separately, or via a different technical mechanism, from noneconomic data (such as the identity of a customer)?

iv. What other changes, if any, will be required of systems typically in use by broker-dealers to provide such data? To what extent can existing broker-dealer systems be employed? What modifications will be necessary? What are the costs and technological ramifications of such changes?

v. What changes, if any, will be required of the systems currently in use by regulators to receive such data? To what extent can existing regulatory systems be employed? What modifications will be necessary? What are the costs and technological ramifications of such changes?

vi. If data reformatting is required, how much must be done by each broker-dealer using its own systems and resources prior to sending data to the central repository, versus being done on the receiving end by the central repository using plan-based systems and resources?

vii. If multiple methods for collecting and aggregating are contemplated by the NMS plan, what are the pros and cons of each method?

viii. How will the plan ensure orders and subsequent events are properly time-sequenced? At what level of granularity will time stamps be stored for each event? Milliseconds? Microseconds? Picoseconds? Describe any differences in the accuracy at which events originating in the same broker-dealer system can be sequenced versus events across different systems at the same broker-dealer, or systems at different broker-dealers. What type of synchronization of clocks will be employed to minimize inter-system timing inaccuracies?

ix. If time stamps are not stored at a sufficient level of granularity to properly sequence events, what other data or mechanisms will the NMS plan provide to meet the requirement that regulators be able to time-sequence events?

x. Even if time stamps are sufficiently granular to meet the time-sequencing requirements of today, how would the plan contemplate increasing that granularity as the speed of trading increases?

4. Database Security, Contingency Planning, and Prospects for Growth

The data stored in the consolidated audit trail database will contain

confidential detailed records of trade and order flow by customer.

i. How will the plan ensure the security of the database in a way that provides for flexible access by permitted users at multiple regulators (*i.e.*, the Commission and the SROs), but denies access to all other non-permitted users?

ii. What are the plan's policies and procedures with regards to security? Will the plan make use of any specific national or international security standards? If so, which ones? Will the plan make use of third-party reviews of its security procedures?

iii. What types of contingency and backup plans will be employed by the plan to safeguard against the loss of data due to technical failures? Will the plan make use of live failover mechanisms so that data being sent to the database is not inadvertently lost in the event of a failure? Will contingency plans provide regulators with uninterrupted access to the database? If not, what are the expectations for recovery times under different failure scenarios?

iv. As order and trade volumes increase, how does the plan contemplate handling the need for increased capacity and throughput? Would the plan be able to accommodate a doubling in daily volume without materially altering the basic technologies and architecture? A ten-time increase? A 100-times increase?

5. Database Access

As part of an investigation or examination, regulators may need to analyze historical trades and orders in the database maintained by the central repository (though not trade and order events occurring prior to the implementation of the consolidated audit trail).

i. How much historical data will be stored "on-line" in the database and be available for immediate search and extraction?

ii. How will data be archived if it is no longer stored on-line? How will regulators access and search data that has been archived?

iii. Will third parties have access to historical data? How will this access differ from the regulatory access?

c. Extension of Time for Submission of NMS plan

Proposed Rule 613 required the SROs to jointly file the NMS plan within 90 days from approval of Rule 613. The Commission received a comment letter specifically suggesting that a six-month period, rather than the 90-day period originally proposed, would be more appropriate for the submission of the NMS plan to ensure that the NMS plan

is drafted with an informed understanding of how order and trade processing works so that the consolidated audit trail systems are capable of achieving the Commission's objectives.⁸⁵⁵ To this end the commenter recommended that the Rule mandate the formation of cross-market participant working groups; outline the objectives of consolidated audit trail rather than identify technical requirements; and allow six months for the cross-participant working groups to perform a requirements analysis as part of the development of the NMS plan.⁸⁵⁶

In response to this commenter and other commenters that suggested that the Commission rely on an industry working group to create the consolidated audit trail⁸⁵⁷ and to provide sufficient time for the SROs to draft the additional provisions required by the Rule⁸⁵⁸ and to prepare responses to the considerations and the use cases for inclusion in the NMS plan,⁸⁵⁹ the Commission is extending the timeframe for the submission of the NMS plan from 90 days from approval of Rule 613 to 270 days from the date of publication of the Adopting Release in the **Federal Register**.⁸⁶⁰

3. NMS Plan Costs

a. NMS Plan Cost Estimates

This section sets forth the Commission's estimates of the costs to prepare and file the NMS plan. As noted above, as part of the multi-step process for developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail, the Commission is deferring its economic analysis of the consolidated audit trail (other than with respect to the NMS plan) until after the NMS plan, together with its detailed information and analysis, has been submitted by the

⁸⁵⁵ See FIF Letter II, p. 2. See also STA Letter, p. 2 (stating "[t]he SEC should allow six months for the CAT selection process rather than the two months currently identified in the proposed release").

⁸⁵⁶ See FIF Letter II, p. 3.

⁸⁵⁷ See Direct Edge Letter, p. 2-3, 5. See also STA Letter, p. 1-3.

⁸⁵⁸ These additional provisions relate to: (1) The security and confidentiality of the central repository (see Rule 613(e)(4)(i)(A) through (D) and Section III.B.2.e., *supra*); (2) error rates (see Rule 613(e)(6) and Section III.B.2.c., *supra*); (3) an Advisory Committee (see Rule 613(b)(7) and Section III.B.3.b., *supra*); (4) a retrospective assessment of the performance of the consolidated audit trail, as well as a plan to improve its performance (see Rule 613(b)(6)(i) through (iv) and Section III.B.3.b., *supra*); and (5) potential penalties (see Rule 613(h)(3) and Section III.B.3.a.1., *supra*).

⁸⁵⁹ See Sections III.C.2.a. and c., *supra*.

⁸⁶⁰ See Section I., *supra*. See also Section III.D., *infra*, for a discussion of the timelines pertaining to the implementation of the consolidated audit trail.

SROs to the Commission for its consideration and there has been an opportunity for public comment.⁸⁶¹ The Commission believes that an economic analysis of the consolidated audit trail is more appropriately performed once the SROs narrow the expanded array of choices they have and developed a detailed NMS plan.⁸⁶² At that time, the Commission will have available to it detailed information provided by the SROs, and any additional information provided by commenters once the NMS plan is published for comment. The cost estimates set forth below, therefore, only reflect the Commission's estimates as to the costs to the SROs for developing an NMS plan to be submitted to the Commission. These cost estimates do not reflect the much more significant initial and ongoing costs that would be incurred if such NMS plan were approved by the Commission and the implementation of the consolidated audit trail begins.

The Commission notes that the requirement to develop and submit the NMS plan also is a collection of information within the meaning of the Paperwork Reduction Act of 1995 ("PRA").⁸⁶³ Section IV. below describes in detail the burdens associated with the requirement that the SROs develop and submit an NMS plan.

i. Preliminary Cost Estimates from Proposing Release

In the Proposing Release, the Commission estimated that each SRO, on average, would incur an aggregate one-time cost of approximately \$234,000⁸⁶⁴ to prepare and file the NMS

plan, for an estimated aggregate cost of about \$3.5 million.⁸⁶⁵

In making these estimates, the Commission assumed that the cost of developing and filing the NMS plan pursuant to the proposed Rule would be comparable to the cost to create other existing NMS plans.⁸⁶⁶ Underlying the Commission's estimates were estimates of the amount of time the Commission believed would likely be spent by Programmer Analysts, Business Analysts, Attorneys, and Compliance Managers. The Commission did not receive any comments on these specific cost estimates.

ii. Revised Cost Estimates

As noted above, the Commission based its original estimates of the cost to prepare and file the NMS plan on the costs incurred with existing NMS plans. The adopted Rule, however, has been modified from the proposed Rule in several significant ways that differentiate the costs to prepare the NMS plan from all other existing NMS plans. These modifications require the SROs to: (1) Provide additional information and analysis while addressing the considerations that are set forth in Rule 613(a)(1);⁸⁶⁷ (2) include additional provisions that were not required by the proposed Rule relating to enforcement mechanisms,⁸⁶⁸ security and confidentiality,⁸⁶⁹ and the preparation of a document every two years that contains a retrospective assessment of the performance of the consolidated audit trail, as well as a plan to improve its performance;⁸⁷⁰ (3) address error rates;⁸⁷¹ and (4) provide

for the creation of an Advisory Committee.⁸⁷²

(A) Revised Initial Costs To Create and File the NMS Plan

In light of these modifications to the proposed Rule, the Commission no longer believes that the cost of developing and filing the NMS plan pursuant to the proposed Rule would be sufficiently comparable to the cost to create other existing NMS plans to use those costs as a basis for developing a cost estimate for the NMS plan required by Rule 613. Instead, as discussed in more detail below, the Commission is increasing its estimated costs for the development and filing of the NMS plan due to the increases in the hours that likely would be spent to create the NMS plan by the SROs.⁸⁷³ The Commission also is adjusting its preliminary cost estimate for the creation and filing of an NMS plan to reflect updated 2011 wage figures, as well as the registration of two additional SROs, since the preliminary estimates were developed.⁸⁷⁴ Specifically, the Commission now estimates that the aggregate one-time cost for creating and filing an NMS plan would be approximately \$718,000 per SRO,⁸⁷⁵ or approximately \$12.2 million

⁸⁷² See Rule 613(b)(7).

⁸⁷³ Commission staff now estimates that each SRO would expend 700 Attorney hours, 300 Compliance Manager hours, 880 Programmer Analyst hours, and 880 Business Analyst hours.

⁸⁷⁴ The \$378 per-hour figure for an Attorney; the \$279 per hour figure for a Compliance Manager; the \$196 per hour figure for a Programmer Analyst; and the \$201 per hour figure for a Business Analyst (Intermediate) are from SIFMA's *Management & Professional Earnings in the Securities Industry 2011*, modified by Commission staff to account for an 1800-hour work-year and multiplied by 5.35 to account for bonuses, firm size, employee benefits, and overhead. At the time the Proposing Release was published, there were 14 national securities exchanges. On August 13, 2010, the Commission granted the application of BATS-Y Exchange for registration as a national securities exchange. See Securities Exchange Act Release No. 62719, 75 FR 51295 (August 19, 2010). Additionally, on April 27, 2012, the Commission granted the application of BOX Options Exchange for registration as a national securities exchange. See Securities Exchange Act Release No. 66871, 77 FR 26323 (May 3, 2012).

⁸⁷⁵ Commission staff estimates that each SRO would incur an aggregate one-time cost of (700 Attorney hours × \$378 per hour) + (300 Compliance Manager hours × \$279 per hour) + (880 Programmer Analyst hours × \$196 per hour) + (880 Business Analyst hours × \$201 per hour) = \$697,660 per SRO to prepare and file an NMS plan. In addition, Commission staff estimates that each SRO would incur a one-time external cost of (50 legal hours × \$400 per hour) = \$20,000. As a result, the Commission staff estimates that the aggregate one-time cost to each SRO to prepare and file an NMS plan, including external costs, would be (\$20,000 in external costs) + (\$697,660 in aggregate internal costs) = \$717,660 per SRO to prepare and file an NMS plan.

⁸⁶¹ See Section I., *supra*. See also Rule 613(a)(5) (providing, in part, that the Commission "shall consider the impact of the national market system plan, or amendment, as applicable, on efficiency, competition, and capital formation").

⁸⁶² See Section I., *supra*.

⁸⁶³ 44 U.S.C. 3501 *et. seq.*

⁸⁶⁴ Commission staff estimated that each SRO would expend (400 Attorney hours × \$305 per hour) + (100 Compliance Manager hours × \$258 per hour) + (220 Programmer Analyst hours × \$193 per hour) + (120 Business Analyst hours × \$194 per hour) = \$213,540 per SRO to prepare and file the NMS plan. Commission staff also estimated that each SRO would outsource, on average, 50 hours of legal work, at an average hourly rate of \$400, for a total of \$20,000 per SRO, for an aggregate one-time cost to prepare and file an NMS plan of \$233,540 per SRO. See Proposing Release, *supra* note 4, at 32596.

The \$305 per hour figure for an Attorney; the \$258 per hour figure for a Compliance Manager; the \$193 per hour figure for a Programmer Analyst; and the \$194 per hour figure for a Business Analyst (Intermediate) were from SIFMA's *Management & Professional Earnings in the Securities Industry 2008*, modified by Commission staff to account for an 1800-hour work-year and multiplied by 5.35 to account for bonuses, firm size, employee benefits, and overhead. Based on industry sources, the Commission estimated that the hourly rate for outsourced legal services in the securities industry is \$400 per hour.

⁸⁶⁵ Commission staff estimated that the SROs would incur an aggregate one-time cost of (\$233,540 per SRO) × (15 SROs) = \$3,518,100 to prepare and file an NMS plan.

⁸⁶⁶ See Proposing Release, *supra* note 4, at note 299.

⁸⁶⁷ See Rule 613(a)(1)(i) through (xii); Section III.C.2.a., *supra*.

⁸⁶⁸ See Rule 613(h)(3); Section III.B.3.a.1., *supra*.

⁸⁶⁹ See, e.g., Rule 613(e)(4)(i)(A) through (D). For example, Rule 613(e)(4)(i)(A) requires that the NMS plan require that all plan sponsors and their employees, as well as all employees of the central repository, agree to use appropriate safeguards to ensure the confidentiality of such data and not use such data for purposes other than surveillance or regulatory purposes. Additionally, Rule 613(e)(4)(i)(B) requires the NMS plan to require that each SRO adopt and enforce rules that: (1) Require information barriers between regulatory staff and non-regulatory staff with regard to access and use of data in the central repository and (2) permit only persons designated by plan sponsors to have access to the data in the central repository. See Section III.B.2.e., *supra*.

⁸⁷⁰ See Rule 613(b)(6)(i) through (iv). See Section III.B.3.b., *supra*.

⁸⁷¹ See Rule 613(e)(6)(i) through (ii). See Section III.B.2.c., *supra*. See also Rule 613(e)(6)(iii) through (iv).

in the aggregate,⁸⁷⁶ compared to an initial estimate of \$234,000 per SRO, or approximately \$3.5 million in the aggregate, to prepare and file an NMS plan.⁸⁷⁷

The Commission believes that these revised estimates, which include internal SRO personnel time and external legal costs, are appropriate based on the impact of the modifications to the proposed Rule on each of the job categories underlying the estimates. The Commission believes that the modifications to the proposed Rule will require SRO Programmer Analysts, Business Analysts, Attorneys, and Compliance Managers to expend additional time to address the requirements of the Rule. As discussed in more detail below, the Commission anticipates that the SROs will spend additional time on many activities, including: (1) Research; (2) discussions with members, committees and with industry associations; (3) vendor negotiations; (4) making decisions regarding the various options and increased flexibility provided by the adopted Rule;⁸⁷⁸ (5) reviewing alternative NMS plans; (6) choosing between alternative plans and negotiating to reach a consensus on a single NMS plan; (7) providing a detailed estimate of the costs associated with that NMS plan; and (8) drafting the NMS plan. The Commission also believes that these increased estimates are appropriate in light of the comments, including the comment that the Commission underestimated the time the SROs would spend on business analyses to be performed in designing the NMS plan based on the experience of broker-dealers, vendors and SROs when OATS was expanded to all NMS stocks.⁸⁷⁹ In response, as discussed below, the Commission is increasing its estimated Programmer Analyst, Business Analyst, Attorney, and Compliance Manager hours.

The Commission notes that the average hourly and cost estimates per SRO for creating and filing the NMS plan likely overestimated the costs for some of SROs and underestimated the costs for other SROs. The Commission also believes that certain SROs, particularly those SROs under the same holding company, may decide to collaborate and realize some cost savings on a per SRO basis. On balance,

⁸⁷⁶ Commission staff estimates that the SROs would incur an aggregate one-time cost of $(\$717,660 \text{ per SRO}) \times (17 \text{ SROs}) = \$12,200,200$ to prepare and file an NMS plan.

⁸⁷⁷ See Proposing Release, *supra* note 4, at 32596.

⁸⁷⁸ See Section I., *supra*.

⁸⁷⁹ See FIF Letter II, p. 2–3. See also STA Letter, p. 2–3.

however, the Commission believes that, these hours and cost estimates are reasonable on average even if they may not be precise for any specific SRO.

(i) Programmer Analyst

The Commission is increasing its Programmer Analyst hour estimates from 220 hours to 880 hours per SRO. As discussed in more detail below in Section IV.D.2.a.i., the Commission anticipates that a Programmer Analyst would need to spend substantially more time to address the considerations included in the Rule and the “use cases.” Programmer Analysts may be involved in the NMS plan research, any industry discussions, negotiations with vendors and SROs, and in developing cost estimates for the consolidated audit trail. Thus, for these reasons, the Commission believes it appropriate to increase substantially its estimate of the number of hours expended by Programmer Analysts in the creation and filing of the NMS plan.

(ii) Business Analyst

The Commission is increasing its Business Analyst hour estimates from 360 hours to 880 hours per SRO. As discussed in more detail below in Section IV.D.2.a.ii., the Commission anticipates that a Business Analyst would spend substantially more time to address the considerations and the “use cases,” and overall, an amount of time that is comparable to the time that would likely be spent by Programmer Analysts because Business Analysts will likely be involved in many of the same tasks as Programmer Analysts, but have separate responsibilities as well.

(iii) Attorney

The Commission is increasing its estimates for the hours an Attorney would likely spend to prepare and file an NMS plan from 400 hours to 700 hours per SRO. As discussed in more detail in Section IV.D.2.a.iii. below, the Commission anticipates that an Attorney would spend substantially more time than previously estimated to draft the NMS plan.

(iv) Compliance Manager

The Commission is increasing its Compliance Manager hour estimate from 100 hours to 300 hours per SRO. As discussed in more detail below in Section IV.D.2.a.iv., the Commission anticipates that a Compliance Manager would spend substantially more time than previously estimated to draft the NMS plan.

4. Consideration of Burden on Competition and Promotion of Efficiency, Competition, and Capital Formation

Section 3(f) of the Exchange Act requires the Commission, whenever it engages in rulemaking and is required to consider or determine whether an action is necessary or appropriate in the public interest, to also consider, in addition to the protection of investors, whether the action would promote efficiency, competition, and capital formation. Further, Section 23(a)(2) of the Exchange Act requires the Commission, when making rules under the Exchange Act, to consider the impact such rules would have on competition. Section 23(a)(2) prohibits the Commission from adopting any rule that would impose a burden on competition not necessary or appropriate in furtherance of the purposes of the Exchange Act.

The Commission has focused its economic analysis in this Release on the requirement that the SROs develop an NMS plan, rather than on the actual creation, implementation, and maintenance of a consolidated audit trail itself, and is deferring its economic analysis of the actual creation, implementation, and maintenance of a consolidated audit trail until such time as it may approve the NMS plan submitted to the Commission for its consideration. The Commission’s consideration of the Rule’s impact on efficiency, competition, and capital formation is consistent with this approach. Because the Rule focuses only on the process and the requirement of the development of an NMS plan, the Commission believes that the adopted Rule will have minimal, if any, impact on efficiency, competition, and capital formation.

The Commission regards the adopted Rule as only a step in the multi-step process of developing and approving an NMS plan that will govern the creation, implementation, and maintenance of a consolidated audit trail and the Commission recognizes that the creation, implementation, and maintenance of a consolidated audit trail itself could potentially have effects on efficiency, competition, and capital formation. Therefore, Rule 613(a)(5) specifically provides that the Commission will consider the impact of the NMS plan submitted to the Commission for its consideration on efficiency, competition, and capital formation in determining whether to approve the plan or any amendment thereto. A complete consideration of the impact of the NMS plan, or any amendment thereto, on efficiency,

competition, and capital formation, however, requires information that will not be known until the SROs submit their NMS plan or any amendment thereto. Accordingly, the Commission is deferring this analysis until such time as it may approve the NMS plan, or any amendment thereto, submitted by the SROs. To facilitate the consideration of such possible impacts, the Rule requires SROs to provide their own analysis of the plan's potential impact on efficiency, competition, and capital formation.

D. Implementation of Rule 613 After Approval of the NMS Plan

Proposed Rule 613(a)(3) sets forth a timetable for the implementation of the consolidated audit trail once the Commission has approved an NMS plan. The Commission proposed that the data collection and submission requirements would have applied first to the national securities exchanges and FINRA, and then to their individual members.⁸⁸⁰ Specifically, proposed Rule 613(a)(3)(iii) would have required the plan sponsors to provide to the central repository the data to be required by the Rule within one year after effectiveness of the NMS plan. Members of the exchanges and FINRA would have been required to begin providing to the central repository the data required by the proposed Rule two years after the effectiveness of the NMS plan.⁸⁸¹ This phased approach was intended to allow members additional time to implement the systems changes necessary to begin providing the information to the central repository, including developing procedures to capture any new information required, such as the unique customer and order identifiers.

Additionally, proposed Rule 613(g)(1) would have required each SRO to file a proposed rule change with the Commission on or before 120 days from approval of Rule 613 to require its members to comply with Rule 613. Further, proposed Rule 613(i) would have required the plan sponsors to jointly provide to the Commission, within two months after effectiveness of the NMS plan, a document outlining how the plan sponsors would propose to incorporate into the consolidated audit trail information with respect to equity securities that are not NMS securities, debt securities, primary market transactions in NMS stocks, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities, including details for each

order and reportable event that would be required to be provided, which market participants would be required to provide the data, an implementation timeline, and a cost estimate.

Although one commenter agreed that the consolidated audit trail could be implemented according to the timeline originally proposed,⁸⁸² and another urged the Commission to expedite implementation of Rule 613,⁸⁸³ several commenters stated that more time would be necessary to develop and implement the NMS plan.⁸⁸⁴ Many commenters suggested extended timelines for various aspects of the consolidated audit trail.⁸⁸⁵ Two commenters, however, argued that the timetable for implementation should be shortened,⁸⁸⁶ and one of the commenters suggested that the Commission use existing infrastructure, naming OATS as an example, as the basis of the audit trail to save implementation time.⁸⁸⁷ Another commenter requested that the Commission move the deadline for submission of the joint document from the SROs outlining a proposal of how an expansion could occur from two months, as proposed, to one year after approval of the NMS plan, to allow time to choose a technology provider and build the infrastructure of the system, stating that “[i]t would be far better to develop the design for the initial products and leverage this knowledge to later phases.”⁸⁸⁸

The Commission also received two comment letters recommending that the Rule contain an exemption to accommodate the business model of small broker-dealers.⁸⁸⁹

After considering the comments regarding the proposed timeline for implementation of the Rule, the Commission is adopting Rule 613 with changes to the proposed Rule. First, the Commission is adopting a deadline of 60 days from effectiveness of the NMS plan (rather than 120 days from

approval of the Rule, as originally proposed) by when each SRO must file with the Commission proposed rule changes to require its members to comply with the requirements of the Rule and the adopted NMS plan,⁸⁹⁰ so that SROs can sequence their efforts by acting first on developing the NMS plan to be submitted to the Commission for its consideration, and then on proposed rules requiring compliance by their members. Second, in response to the commenter that advocated extending the deadline for the plan sponsors for submission of the joint document outlining how an expansion could occur from two months, as proposed, to one year after effectiveness of the approved NMS plan, the Commission is modifying the proposed Rule so that the document will be due to the Commission within six months (rather than two months as proposed) after the approval of the NMS plan. The Commission believes that this additional four months will provide the time necessary after the submission of the NMS plan to the Commission for the SROs to plan how to expand the consolidated audit trail to capture orders and trading in these additional securities.⁸⁹¹

The Commission has considered the comment letters that requested an exemption from the proposed Rule for small broker-dealers,⁸⁹² but, as discussed above,⁸⁹³ does not believe that it is appropriate to completely exempt smaller broker-dealers from the requirements of the consolidated audit trail. While the Commission does not believe that it is appropriate to completely exempt smaller broker-dealers from the Rule, the Commission, in response to commenters' concerns regarding the potential difficulties for small broker-dealers, is modifying the time by when the NMS plan may require small broker-dealers to comply with Rule 613. The Commission is permitting the SROs in the NMS plan to allow small broker-dealers up to three years after effectiveness, rather than two years as proposed, to begin reporting data to the central repository in recognition that some of these firms may still be handling orders manually and thus will need additional time to upgrade to an electronic method.⁸⁹⁴

⁸⁸⁰ See Rule 613(g)(1).

⁸⁹¹ The Commission notes that the SROs could begin drafting the document even before an NMS plan is approved by the Commission.

⁸⁹² See FINRA Proposal Letter, p. 5–6; Wachtel Letter, p. 1.

⁸⁹³ See Section III.B.1.c., *supra*.

⁸⁹⁴ See Rule 613(a)(3)(vi); *see also* Rule 613(a)(3)(v).

⁸⁸⁰ See proposed Rule 613(a)(3)(iii).

⁸⁸¹ See proposed Rule 613(a)(3)(v).

⁸⁸² See Nasdaq Letter I, p. 3.

⁸⁸³ See Bean Letter, p. 1.

⁸⁸⁴ See FINRA/NYSE Euronext Letter, p. 8; FINRA Letter, p. 15; Scottrade Letter, p. 1; CBOE Letter, p. 7; FIF Letter, p. 8; FIF Letter II, p. 2–3; STA Letter, p. 2–3; Nasdaq Letter I, p. 6–7; Wells Fargo Letter, p. 2–3; Direct Edge Letter, p. 2–3.

⁸⁸⁵ See CBOE Letter, p. 6; Thomson Reuters Letter, p. 3; Liquidnet Letter, p. 2–3, 9; Ameritrade Letter, p. 3; Nasdaq Letter I, p. 7–9; Scottrade Letter, p. 1; SIFMA Letter, p. 13. *See also* FIF Letter, p. 8; FIF Letter II, p. 2–3; STA Letter, p. 2–3; Wells Fargo Letter, p. 2–3; FINRA/NYSE Euronext Letter, p. 8; FINRA Letter, p. 15.

⁸⁸⁶ See Kaufman Letter, Attachment p. 1; Schumer Letter, p. 1.

⁸⁸⁷ See Schumer Letter, p. 1.

⁸⁸⁸ See Nasdaq Letter I, p. 7.

⁸⁸⁹ See FINRA Proposal Letter, p. 5–6; and Wachtel Letter, p. 1.

Additionally, because many of these broker-dealers may have limited resources, the Commission encourages plan sponsors to propose in the NMS plan a requirement that small broker-dealers report data to the central repository within three years after effectiveness of the NMS plan, as the Commission believes that providing small broker-dealers a longer implementation time should assist such broker-dealers in identifying the most cost-effective and the most efficient manner in which to procure third-party software or make any systems modifications or other changes to comply with Rule 613.

Rule 613(a)(3)(vi) uses the definition of “small broker-dealer” contained in Exchange Act Rule 0–10: “Small entities under the Securities Exchange Act for purposes of the Regulatory Flexibility Act.”⁸⁹⁵ Rule 0–10(c) defines a “small broker-dealer” as a broker or dealer that: (1) Had total capital (net worth plus subordinated liabilities) of less than \$500,000 on the date in the prior fiscal year as of which its audited financial statements were prepared pursuant to 240.17a5(d) or, if not required to file such statements, a broker or dealer that had total capital (net worth plus subordinated liabilities) of less than \$500,000 on the last business day of the preceding fiscal year (or in the time that it has been in business, if shorter); and (2) is not affiliated with any person (other than a natural person) that is not a small business or small organization as defined in this section.⁸⁹⁶ The Commission believes that applying this definition is appropriate because it is an existing regulatory standard that is an indication of small entities for which regulators should be sensitive when imposing regulatory burdens.

The Commission notes that not all of the timeframes for implementation are being revised.⁸⁹⁷ As discussed in

⁸⁹⁵ 17 CFR 240.0–10.

⁸⁹⁶ 17 CFR 240.0–10(c).

⁸⁹⁷ Pursuant to Rules 613(a)(3)(i) through (vi), the NMS plan must require the SROs to meet the following implementation deadlines: (1) Within two months after effectiveness of the national market system plan jointly (or under the governance structure described in the plan) select a person to be the plan processor; (2) within four months after effectiveness of the national market system plan synchronize their business clocks and require members of each such exchange and association to synchronize their business clocks in accordance with Rule 613(d); (3) within one year after effectiveness of the national market system plan provide to the central repository the data specified in Rule 613(c); (4) within fourteen months after effectiveness of the national market system plan implement a new or enhanced surveillance system(s) as required by Rule 613(f); (5) within two years after effectiveness of the NMS plan, require members of each such exchange and association (except those that qualify as small broker-dealers as

Section III.B.1.f., above, the Commission has learned through the comment process that technology exists today to “normalize” information collected for the consolidated audit trail into a uniform electronic format, which will allow the required data to be captured and reported to the central repository more readily than the Commission originally anticipated. Accordingly, the Commission believes the remaining proposed implementation timeframes are reasonable and is adopting them as proposed.

IV. Paperwork Reduction Act

Certain provisions of the Rule contain “collection of information requirements” within the meaning of the PRA. The Commission published notice requesting comment on the collection of information requirements in the Proposing Release and submitted the proposed collection to the Office of Management and Budget (“OMB”) for review in accordance with 44 U.S.C. 3507 and 5 CFR 1320.11. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The control number for Rule 613 is OMB Control No. 3235–0671 and the title of the new collection of information is “Creation of a Consolidated Audit Trail Pursuant to Section 11A of the Securities Exchange Act of 1934 and Rules thereunder.”

This Release includes the Commission’s estimates of the costs to create and file the NMS plan.⁸⁹⁸ As noted above, the Commission is deferring its economic analysis of the consolidated audit trail (other than with respect to the NMS plan) until after the NMS plan, including the detailed information and analysis, has been submitted by the SROs and there has been an opportunity for public comment.⁸⁹⁹ Similarly, the Commission is discussing below its estimates of the burden hours associated with the development and filing of the NMS plan but is deferring its discussion of the much more significant burden hours associated with the other paperwork

defined in § 240.0–10(c) to provide to the central repository the data specified in Rule 613(c); and (6) within three years after effectiveness of the national market system plan require members of each such exchange and association that qualify as small broker-dealers as defined in § 240.0–10(c) to provide to the central repository the data specified in Rule 613(c).

⁸⁹⁸ See Section III.C.3., *supra*.

⁸⁹⁹ See Rule 613(a)(5) (providing, in part, that the Commission “shall consider the impact of the national market system plan on efficiency, competition, and capital formation”). See also Section I., *supra*.

requirements of the consolidated audit trail. The Commission also is deferring its discussion of the ongoing burden hours associated with the NMS plan because such ongoing burdens would only be incurred if the Commission approves the NMS plan. Instead, the Commission will defer these discussions until after the NMS plan, including the detailed information and analysis, has been submitted by the SROs and there has been an opportunity for public comment.

A. Summary of Collection of Information Under Rule 613

Rule 613 requires the SROs to develop and file an NMS plan to govern the creation, implementation, and maintenance of a consolidated audit trail and central repository for the collection of information for NMS securities.⁹⁰⁰ The NMS plan must require each SRO and its respective members to provide certain data to the central repository in compliance with Rule 613.⁹⁰¹ The NMS plan also must include a discussion of specified considerations,⁹⁰² and certain provisions related to administration and operation of the plan⁹⁰³ and the operation of the central repository.⁹⁰⁴

⁹⁰⁰ See Rule 613(a)(1).

⁹⁰¹ See Rule 613(c).

⁹⁰² See Rule 613(a)(1)(i) through (xii).

⁹⁰³ For example, the NMS plan must include provisions: (1) To ensure fair representation of the plan sponsors; (2) for administration of the central repository, including selection of the plan processor; (3) addressing the requirements for admission of new plan sponsors and withdrawal of existing plan sponsors; (4) addressing the percentage of votes required by the plan sponsors to effectuate amendments to the plan; (5) addressing the manner in which the costs of operating the central repository would be allocated among the SROs that are sponsors of the plan, including a provision addressing the manner in which costs would be allocated to new sponsors to the plan; (6) requiring the appointment of a Chief Compliance Officer to regularly review the operation of the central repository to assure its continued effectiveness, and make any appropriate recommendations for enhancements to the nature of the information collected and the manner in which it is processed; and (7) including an enforcement mechanism to ensure that each SRO and member is collecting and providing to the central repository the information required. See Rule 613(b), 613(g)(4), and 613(h)(3).

⁹⁰⁴ For example, the NMS plan must include a provision requiring the creation and maintenance by the plan processor of a method of access to the data stored in the central repository, that includes the ability to run searches and generate reports. See Rule 613(e)(3). Additionally, the NMS plan is required to include policies and procedures, including standards, to be used by the plan processor to: (1) Ensure the security and confidentiality of all information submitted to the central repository; (2) ensure the timeliness, accuracy, integrity and completeness of the data provided to the central repository; and (3) ensure the accuracy of the consolidation by the plan processor of the data provided to the central repository. See Rule 613(e)(4). The NMS plan also

Further, the NMS plan is required to include certain provisions related to compliance by the SROs and their members with the requirements of the Rule and the NMS plan.⁹⁰⁵

The Commission believes that requiring an NMS plan imposes a paperwork burden on the SROs associated with preparing and filing the joint NMS plan.

B. Use of Information

The information contained in the NMS plan submitted to the Commission for its consideration will provide the Commission and the public with detailed information regarding how the consolidated audit trail will be created, implemented, and maintained in order for the Commission and the public to be able to carefully consider all aspects of the NMS plan. Further, the information contained in the NMS plan should facilitate an analysis of how well the NMS plan will allow regulators to effectively and efficiently carry out their responsibilities.

C. Respondents

Rule 613 applies to the 16 national securities exchanges and to one national securities association (FINRA) currently registered with the Commission.⁹⁰⁶

must include a provision requiring the plan sponsors to provide to the Commission, at least every two years after effectiveness of the national market system plan, a written assessment of the operation of the consolidated audit trail. See Rule 613(b)(6). The NMS plan is also required to include an Advisory Committee to advise the plan sponsors on the implementation, operation and administration of the central repository. See Rule 613(b)(7). Further, the NMS plan must specify a maximum error rate to be tolerated by the central repository for the data it collects, and processes for identifying and correcting errors in the data, for notifying the entities responsible for the reporting of the erroneous data, and for disciplining those who repeatedly report erroneous data. See Rule 613(e)(6)(i) through (iv). The NMS plan must also specify as a time by which the corrected data will be available to regulators. See Rule 613(e)(6)(iv).

⁹⁰⁵ The NMS plan must include: (1) A provision that makes each SRO that sponsors the plan responsible for enforcing compliance by its members with the provisions of the plan; and (2) mechanisms to ensure that plan sponsors and their members comply with the requirements of the plan. See Rules 613(g)(3), 613(g)(4), and 613(h)(3).

⁹⁰⁶ At the time the Proposing Release was published, there were 14 national securities exchanges. On August 13, 2010, the Commission granted the application of BATS-Y Exchange for registration as a national securities exchange. See Securities Exchange Act Release No. 62719, 75 FR 51295 (August 19, 2010). Additionally, on April 27, 2012, the Commission granted the application of BOX Options Exchange for registration as a national securities exchange. See Securities Exchange Act Release No. 66871, 77 FR 26323 (May 3, 2012).

D. Total Annual Reporting and Recordkeeping Burden for the Creation and Filing of the NMS Plan

1. Preliminary Burden Hour Estimates from Proposing Release

In the Proposing Release, the Commission estimated that each SRO, on average, would spend approximately 840 hours of legal, compliance, information technology, and business operations time to prepare and file the NMS plan. All together the SROs would spend an estimated 12,600 hours.⁹⁰⁷ The Commission's 840 hour estimate included internal personnel time and external legal costs—400 Attorney hours, 100 Compliance Manager hours, 220 Programmer Analyst hours, and 120 Business Analyst hours. Commission staff also estimated that each SRO would outsource, on average, 50 hours of legal time to develop and draft the NMS plan, at an average hourly rate of \$400, for a total external cost of \$20,000 per SRO.⁹⁰⁸ All together, the SROs would spend an estimated \$300,000 in external costs.⁹⁰⁹

In making these estimates, the Commission assumed that the burden hours necessary for preparing and filing the NMS plan pursuant to the proposed Rule would be comparable to the burden hours needed to create other existing NMS plans.⁹¹⁰ The Commission's estimates included anticipated work hours for Programmer Analysts, Business Analysts, Attorneys and Compliance Managers. The Commission did not receive comments on any of these burden estimates.

2. Revised Burden Hour Estimates

As noted above, the Commission based its original estimates of SRO burden hours to prepare and file the NMS plan on the burden hours spent for existing NMS plans. The Commission, however, has modified the proposed Rule in several significant ways that differentiate the burden hours to prepare the NMS plan from all other existing NMS plans. These modifications require the SROs to expand the NMS plan in the following four ways: (1) Provide additional

⁹⁰⁷ Commission staff estimated that each SRO would spend an aggregate one-time amount of (400 Attorney hours) + (100 Compliance Manager hours) + (220 Programmer Analyst hours) + (120 Business Analyst hours) × (15 SROs) = 12,600 burden hours to prepare and file the NMS plan.

⁹⁰⁸ Based on industry sources, the Commission estimated that the hourly rate for outsourced legal services in the securities industry is \$400 per hour.

⁹⁰⁹ Commission staff estimated that the SROs would spend (\$20,000 per SRO) × (15 SROs) = \$300,000 in external costs to develop and draft the NMS plan.

⁹¹⁰ See Proposing Release, *supra* note 4, at 32596.

information and analysis to address the considerations that are set forth in Rule 613(a)(1);⁹¹¹ (2) include additional provisions that were not required by the proposed Rule relating to enforcement mechanisms,⁹¹² security and confidentiality,⁹¹³ and the preparation of a document every two years that contains a retrospective assessment of the performance of the consolidated audit trail, as well as a plan to improve its performance;⁹¹⁴ (3) address error rates;⁹¹⁵ and (4) provide for the creation of an Advisory Committee.⁹¹⁶

a. Revised Initial Burden Hours Needed To Prepare and File the NMS Plan

In light of these modifications to the proposed Rule, the Commission is increasing substantially its estimated burden hours needed for the development and filing of the NMS plan. The Commission also is adjusting its preliminary burden hour estimates for the preparation and filing of an NMS plan to reflect the registration of two additional SROs after it issued the preliminary estimates.⁹¹⁷ The Commission now estimates that the aggregate one-time burden hour amount for preparing and filing an NMS plan would be approximately 2,760 burden hours with \$20,000 in external costs per SRO,⁹¹⁸ or approximately 46,920 burden hours and \$340,000 in external costs in the aggregate,⁹¹⁹ compared to an

⁹¹¹ See Rule 613(a)(1)(i) through (xii); Section III.C.2.a., *supra*.

⁹¹² See Rule 613(h)(3); Section III.B.3.a.1., *supra*.

⁹¹³ See, e.g., Rule 613(e)(4)(i)(A) through (D). For example, Rule 613(e)(4)(i)(A) requires that the NMS plan require that all plan sponsors and their employees, as well as all employees of the central repository, agree to use appropriate safeguards to ensure the confidentiality of such data and not use such data for purposes other than surveillance or regulatory purposes. Additionally, Rule 613(e)(4)(i)(B) requires the NMS plan to require that each SRO adopt and enforce rules that: (1) Require information barriers between regulatory staff and non-regulatory staff with regard to access and use of data in the central repository and (2) permit only persons designated by plan sponsors to have access to the data in the central repository. See Section III.B.2.e., *supra*.

⁹¹⁴ See Rule 613(b)(6)(i) through (iv). See Section III.B.3.b., *supra*.

⁹¹⁵ See Rule 613(e)(6)(i) through (ii). See Section III.B.2.c., *supra*. See Rule 613(e)(6)(iii) through (iv).

⁹¹⁶ See Rule 613(b)(7).

⁹¹⁷ See note 906, *supra*.

⁹¹⁸ Commission staff estimates that each SRO would spend an aggregate one-time amount of (700 Attorney hours) + (300 Compliance Manager hours) + (880 Programmer Analyst hours) + (880 Business Analyst hours) = 2,760 burden hours per SRO to prepare and file an NMS plan. In addition, Commission staff estimates that each SRO would incur a one-time external cost of (50 legal hours × \$400 per hour) = \$20,000.

⁹¹⁹ Commission staff estimates that the SROs would incur an aggregate one-time amount of (2,760 burden hours per SRO) × (17 SROs) = 46,920

Continued

initial estimate of 840 burden hours per SRO with \$20,000 in external costs, or approximately 12,600 burden hours in the aggregate and \$300,000 in external costs, to prepare and file an NMS plan.⁹²⁰

The Commission believes that these revised estimates, which include internal SRO personnel time and external legal costs, are appropriate based on the Commission's analysis, set forth below, of the impact of the modifications to the proposed Rule on each of the job categories underlying the estimates. The Commission believes that the modifications to the proposed Rule will require SRO Programmer Analysts, Business Analysts, Attorneys, and Compliance Managers to expend additional time to address the requirements of the Rule. As discussed in more detail below, the Commission anticipates that the SROs will spend additional time on many activities, including: (1) Research; (2) discussions with members, committees and with industry associations; (3) vendor negotiations; (4) making decisions regarding the various options and increased flexibility provided by the adopted Rule;⁹²¹ (5) reviewing alternative NMS plans; (6) choosing between alternative plans and negotiating to reach a consensus on a single NMS plan; (7) providing a detailed estimate of the costs associated with that NMS plan; and (8) drafting the NMS plan. The Commission also believes that these increased estimates are appropriate in light of the comments, including the comment that asserted that the Commission underestimated the time the SROs would spend on the business analyses to be performed in designing the NMS plan, based on the experience of broker-dealers, vendors and SROs when OATS was expanded to all NMS stocks.⁹²² In response, as discussed in more detail below, the Commission is increasing its estimated Programmer Analyst, Business Analyst, Attorney and Compliance Manager hours.

The Commission notes that these revised average hourly and cost estimates per SRO for creating and filing the NMS plan likely overestimated the costs for some of SROs and underestimated the costs for other SROs. The Commission also believes that certain SROs, particularly those

SROs under the same holding company, may decide to collaborate and realize some cost savings on a per SRO basis. On balance, however, the Commission believes that, these revised hours and cost estimates are reasonable on average even if they may not be precise for any specific SRO.

(i) Programmer Analyst

The Commission is increasing its estimates for the hours a Programmer Analyst would likely spend with respect to the preparation and filing of the NMS plan from 220 hours, as originally estimated, to 880 hours per SRO. The Commission anticipates that a Programmer Analyst would need to spend substantially more time to address the considerations included in the Rule and the "use cases." Specifically, the SROs will need to rely on Programmer Analysts to help address many of the considerations, as many of those are of a technical nature. For example, several of the considerations relate to the specific features and details of the NMS plan. Programmer Analysts likely will be consulted when the SROs are considering the specific features and details of the NMS plan. The Programmer Analysts likely will provide guidance and information regarding whether a particular feature or detail is technologically possible. The SROs also likely will consult Programmer Analysts when drafting the additional provisions required by the Rule. For example, in drafting the security and confidentiality provisions, Programmer Analysts, who may have knowledge about the information security practices and issues, may be consulted to provide input on a draft provisions in light of technologies with respect to security and confidentiality. Programmer Analysts also may be consulted with respect to addressing errors rates because such analysts may have a technical understanding of trading and reporting systems and be able to provide recommendations on how errors that are introduced can be addressed. In each of these instances, Programmer Analysts may be involved in the NMS plan research, any industry discussions, negotiations with vendors and SROs, and in developing cost estimates for the consolidated audit trail. Thus, for these reasons, the Commission believes it appropriate to increase its estimate of the number of hours expended by Programmer Analysts in the creation and filing of the NMS plan.

(ii) Business Analyst

The Commission is increasing its estimates for the hours a Business

Analyst would likely spend with respect to the preparation and filing of an NMS plan from 360 hours per SRO, as originally estimated, to 880 hours per SRO. The Commission anticipates that a Business Analyst would spend substantially more time to address the considerations and the "use cases." Overall, the Commission anticipates that this amount of additional time will be comparable to the additional time that would likely be spent by Programmer Analysts for the same reasons because Business Analysts will likely be involved in many of the same tasks as Programmer Analysts, albeit with separate responsibilities. The SROs will need to rely on Business Analysts to help address many technical considerations that have relevance to the business and operations of SROs. The Commission also believes that the SROs will need to rely on Business Analysts to work with the Programmer Analysts and the Compliance Managers to analyze the business impact of particular features and details of the NMS plan. Because Rule 613 is less prescriptive than the proposed Rule, Business Analysts may have a larger role in helping to determine which option the NMS plan will propose. Business Analysts also will likely be involved in determining the cost estimates and in analyzing the NMS plan's impact on efficiency, competition, and capital formation. The SROs also likely will consult with Business Analysts when drafting the responses to the considerations and the "use cases," as well as the additional provisions required by the Rule. For example, the SROs likely will consult with Business Analysts on the feasibility, benefits, and costs of any technological upgrades that may be required in order to provide the allocation information described in Rule 613(a)(1)(vi). Further, in drafting the security and confidentiality provisions, Business Analysts may have knowledge about the costs and the business risks of certain security and confidentiality decisions. Business Analysts also may be consulted with respect to addressing error rates because any decisions made may impact business operations and the cost estimates. Further, Business Analysts may likely be consulted by Attorneys with respect to the performance assessment and improvement plan. In each of these instances, Business Analysts may be involved in the NMS plan research, any industry discussions (particularly with members and other SROs), negotiations with vendors and SROs, and in developing cost estimates for the

burden hours to prepare and file an NMS plan. Commission staff estimates that (\$20,000 per SRO) × (17 SROs) = \$340,000 in external costs to prepare and file the NMS plan.

⁹²⁰ See Proposing Release, *supra* note 4, at 32596.

⁹²¹ See Section I, *supra*.

⁹²² See FIF Letter II, p. 2–3. See also STA Letter, p. 2–3.

consolidated audit trail. Thus, for these reasons, the Commission believes it is appropriate to increase its estimate of the number of hours expended by Business Analysts in the creation and filing of the NMS plan.

(iii) Attorney

The Commission is increasing its Attorney hour estimates from 400 hours to 700 hours per SRO. The Commission now anticipates that an Attorney would spend substantially more time than the Commission had previously estimated to draft the NMS plan. The NMS plan that Attorneys would draft must now include a discussion of the considerations and the additional provisions required by the Rule, and must reflect additional consultations with Programmer Analysts, Business Analysts and Compliance Managers. Further, the NMS plan drafted also would likely reflect additional consultation on the “use cases.” The NMS plan proposal would also likely require Attorney work on the Advisory Committee requirement and on the NMS plan policies and procedures to be used by the plan processor⁹²³ to ensure the security and confidentiality and accuracy of the information submitted to the central repository.⁹²⁴ Attorney work would also be required on the mechanism to enforce compliance by plan sponsors with the NMS plan, as required by Rule 613(h)(3), including penalty provisions, if the plan sponsors deem appropriate. The Commission believes that an Attorney would also be involved in the NMS plan research, any industry discussions, negotiations with vendors, negotiations with SROs (in particular, to reach consensus on an NMS plan), and in developing cost estimates for the consolidated audit trail. Thus, for these reasons, the Commission believes it appropriate to increase its estimate of the number of hours expended by Attorneys in the creation and filing of the NMS plan.

(iv) Compliance Manager

The Commission is increasing its Compliance Manager hour estimates from 100 hours to 300 hours per SRO.

⁹²³ See Rule 613(e)(4). The Commission believes that an outline or overview description of the policies and procedures, including standards, to be used by the plan processor that would be implemented under the NMS plan submitted to the Commission for its consideration would be sufficient to satisfy the requirement of the Rule. The Commission believes it is important for the NMS plan to establish the fundamental framework of these policies and procedures, but recognizes the utility of allowing the plan sponsors flexibility to subsequently delineate them in greater detail with the ability to make modifications as needed. See Section III.B.2.e., *supra*.

⁹²⁴ See Rule 613(e)(4)(i)(A) through (D).

The Commission now anticipates that a Compliance Manager would spend substantially more time than the Commission had previously estimated to draft the NMS plan. Compliance Managers likely will help shape provisions of the NMS plan that deal with monitoring member and SRO compliance with the NMS plan’s requirements. Compliance Managers likely will also be involved in the Advisory Committee requirement. They likely will also work on NMS plan policies and procedures to be used by the plan processor to ensure the security and confidentiality and accuracy of the information submitted to the central repository, and to ensure that these policies and procedures are feasible for SRO compliance and for member compliance.⁹²⁵ They will likely also work on the mechanism to enforce compliance by plan sponsors with the NMS plan, as required by Rule 613(h)(3), including penalty provisions, if the plan sponsors deem appropriate. Further, Compliance Managers will also work on NMS plan provisions that address error rates and performance assessment and improvement. The Commission believes that Compliance Managers may also be involved in the NMS plan research and industry discussions (particularly with regard to SRO and member compliance issues). Thus, for these reasons, the Commission believes it is appropriate to increase its estimate of the number of hours expended by Compliance Managers in the creation and filing of the NMS plan.

E. Collection of Information Is Mandatory

The collection of information discussed above is a mandatory collection of information.

F. Confidentiality

The Rule requires that the data to be recorded and reported to the central repository will only be available to the SROs and the Commission for the purpose of performing their respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations.⁹²⁶ Further, the NMS plan submitted to the Commission for its consideration pursuant to the adopted Rule is required to include policies and procedures to ensure the security and confidentiality of all information submitted to the central repository, and to ensure that all plan sponsors and their employees, as well as all employees of the central repository, use appropriate safeguards to ensure the

⁹²⁵ See Rule 613(e)(4)(i)(A) through (D).

⁹²⁶ See Rule 613(e)(2).

confidentiality of such data and shall agree not to use such data for any purpose other than surveillance and regulatory purposes.⁹²⁷

G. Retention Period of Recordkeeping Requirements

The SROs are required to retain records and information pursuant to Rule 17a–1 under the Exchange Act.⁹²⁸ Members are required to retain records and information in accordance with Rule 17a–4 under the Exchange Act.⁹²⁹

V. Regulatory Flexibility Act Certification

The Regulatory Flexibility Act (“RFA”)⁹³⁰ requires Federal agencies, in promulgating rules, to consider the impact of those rules on small entities. Section 603(a) of the Administrative Procedure Act, as amended by RFA, generally requires the Commission to undertake a regulatory flexibility analysis of all proposed rules, or proposed rule amendments, to determine the impact of such rulemaking on “small entities.”⁹³¹ Rule 605(b) of the RFA states that this requirement shall not apply to any proposed rule or proposed rule amendment, which if adopted, would not “have a significant economic impact on a substantial number of small entities.”⁹³²

In the Proposing Release, the Commission requested comment on whether proposed Rule 613 would have a significant economic impact on a substantial number of small entities, and, if so, what would be the nature of any impact on small entities.⁹³³ The Commission also requested that commenters provide empirical data to support the extent of such impact.⁹³⁴ The Commission received two comments on the general anticipated effect of the proposed Rule on small-broker dealers; FINRA and a small broker-dealer that solely handles orders manually requested that an exemption from the proposed Rule be adopted to accommodate the business model of

⁹²⁷ See proposed Rule 613(e)(4)(i).

⁹²⁸ 17 CFR 240.17a–1.

⁹²⁹ 17 CFR 240.17a–4.

⁹³⁰ 5 U.S.C. 601 *et seq.*

⁹³¹ Although Section 601(6) of the RFA defines the term “small entity,” the statute permits agencies to formulate their own definitions. The Commission has adopted definitions for the term “small entity” for the purposes of Commission rulemaking in accordance with the RFA. Those definitions, as relevant to this rulemaking, are set forth in Rule 0–10, 17 CFR 240.0–10. See Securities Exchange Act Release No. 18451 (January 28, 1982), 47 FR 5215 (February 4, 1982) (File No. AS–305).

⁹³² 5 U.S.C. 605(b).

⁹³³ See Proposing Release, *supra* note 4, at 32607.

⁹³⁴ *Id.*

small broker-dealers.⁹³⁵ In response to the commenters, the Commission amended the Rule as proposed to provide additional time for small broker-dealers to comply with the reporting requirements of Rule 613.⁹³⁶ The Commission notes that none of the comment letters received specifically responded to the Commission's initial regulatory flexibility analysis.

As proposed and as adopted, Rule 613 requires the SROs to file an NMS plan to create, implement, and maintain the consolidated audit trail. In response to commenters and as discussed in this release, the Commission has modified the proposed Rule to provide the SROs with a range of options and greater flexibility for how they choose to meet the requirements of the Rule. As a result, the Commission will not know the specific requirements of the NMS plan until it is filed with the Commission, and cannot analyze how the NMS plan will impact small entities until then. At this time, there are no small entities "subject to the requirements" of Rule 613.⁹³⁷

However, because Rule 613 requires that the national securities exchanges and national securities associations (*i.e.*, FINRA) file an NMS plan with the Commission, for purposes of the RFA, the Commission is undertaking an analysis of how the NMS plan filing requirement will impact the exchanges and FINRA to ascertain whether the exchanges and FINRA are "small businesses." Paragraph (e) of Rule 0-10 provides that for the purposes of the RFA, an exchange is considered a "small business" if it has been exempted from the reporting requirements of Rule 601 of Regulation NMS,⁹³⁸ and is not affiliated with any person (other than a natural person) that is not a small business or small organization as defined in Rule 0-10. Under this standard, none of the national securities exchanges subject to Rule 613 is a "small business" for purposes of the RFA. In addition, FINRA is not a small entity as defined in Rule 0-10.⁹³⁹ Therefore, the Commission believes that Rule 613, which requires that the SROs file an NMS plan with the Commission to create, implement, and maintain the consolidated audit trail, will not have a significant economic impact on a substantial number of small entities because this requirement will only

apply to the existing national securities exchanges and national securities associations, which do not qualify as small entities pursuant to the RFA.

For the foregoing reasons, the Commission hereby certifies that, pursuant to 5 U.S.C. 605(b), Rule 613 will not have a significant economic impact on a substantial number of small entities.

VI. Statutory Authority

Pursuant to the Exchange Act and particularly, Sections 2, 3(b), 5, 6, 11A, 15, 15A, 17(a) and (b), 19, and 23(a) thereof, 15 U.S.C. 78b, 78c(b), 78e, 78f, 78k-1, 78o, 78o-3, 78q(a) and (b), 78s and 78w(a), the Commission is adopting Rule 613 of Regulation NMS, as set forth below.

Text of Rule

List of Subjects in 17 CFR Part 242

Brokers, Reporting and recordkeeping requirements, Securities.

In accordance with the foregoing, Title 17, Chapter II, of the Code of Federal Regulations is amended as follows.

PART 242—REGULATIONS M, SHO, ATS, AC, AND NMS AND CUSTOMER MARGIN REQUIREMENTS FOR SECURITY FUTURES

- 1. The authority citation for part 242 continues to read as follows:

Authority: 15 U.S.C. 77g, 77q(a), 77s(a), 78b, 78c, 78g(c)(2), 78i(a), 78j, 78k-1(c), 78l, 78m, 78n, 78o(b), 78o(c), 78o(g), 78q(a), 78q(b), 78q(h), 78w(a), 78dd-1, 78mm, 80a-23, 80a-29, and 80a-37.

- 2. Add § 242.613 to read as follows:

§ 242.613 Consolidated audit trail.

(a) *Creation of a national market system plan governing a consolidated audit trail.*

(1) Each national securities exchange and national securities association shall jointly file on or before 270 days from the date of publication of the Adopting Release in the **Federal Register** a national market system plan to govern the creation, implementation, and maintenance of a consolidated audit trail and central repository as required by this section. The national market system plan shall discuss the following considerations:

(i) The method(s) by which data will be reported to the central repository including, but not limited to, the sources of such data and the manner in which the central repository will receive, extract, transform, load, and retain such data; and the basis for selecting such method(s);

(ii) The time and method by which the data in the central repository will be made available to regulators, in accordance with paragraph (e)(1) of this section, to perform surveillance or analyses, or for other purposes as part of their regulatory and oversight responsibilities;

(iii) The reliability and accuracy of the data reported to and maintained by the central repository throughout its lifecycle, including transmission and receipt from market participants; data extraction, transformation and loading at the central repository; data maintenance and management at the central repository; and data access by regulators;

(iv) The security and confidentiality of the information reported to the central repository;

(v) The flexibility and scalability of the systems used by the central repository to collect, consolidate and store consolidated audit trail data, including the capacity of the consolidated audit trail to efficiently incorporate, in a cost-effective manner, improvements in technology, additional capacity, additional order data, information about additional securities or transactions, changes in regulatory requirements, and other developments;

(vi) The feasibility, benefits, and costs of broker-dealers reporting to the consolidated audit trail in a timely manner:

(A) The identity of all market participants (including broker-dealers and customers) that are allocated NMS securities, directly or indirectly, in a primary market transaction;

(B) The number of such securities each such market participant is allocated; and

(C) The identity of the broker-dealer making each such allocation;

(vii) The detailed estimated costs for creating, implementing, and maintaining the consolidated audit trail as contemplated by the national market system plan, which estimated costs should specify:

(A) An estimate of the costs to the plan sponsors for establishing and maintaining the central repository;

(B) An estimate of the costs to members of the plan sponsors, initially and on an ongoing basis, for reporting the data required by the national market system plan;

(C) An estimate of the costs to the plan sponsors, initially and on an ongoing basis, for reporting the data required by the national market system plan; and

(D) How the plan sponsors propose to fund the creation, implementation, and maintenance of the consolidated audit

⁹³⁵ See FINRA Proposal Letter, p. 5-6 and Wachtel Letter, p. 1.

⁹³⁶ See Rule 613(a)(3)(vi).

⁹³⁷ Section 604(a)(4) of the RFA.

⁹³⁸ 17 CFR 242.601.

⁹³⁹ 13 CFR 121.201.

trail, including the proposed allocation of such estimated costs among the plan sponsors, and between the plan sponsors and members of the plan sponsors;

(viii) An analysis of the impact on competition, efficiency and capital formation of creating, implementing, and maintaining of the national market system plan;

(ix) A plan to eliminate existing rules and systems (or components thereof) that will be rendered duplicative by the consolidated audit trail, including identification of such rules and systems (or components thereof); to the extent that any existing rules or systems related to monitoring quotes, orders, and executions provide information that is not rendered duplicative by the consolidated audit trail, an analysis of:

(A) Whether the collection of such information remains appropriate;

(B) If still appropriate, whether such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail; and

(C) If no longer appropriate, how the collection of such information could be efficiently terminated; the steps the plan sponsors propose to take to seek Commission approval for the elimination of such rules and systems (or components thereof); and a timetable for such elimination, including a description of how the plan sponsors propose to phase in the consolidated audit trail and phase out such existing rules and systems (or components thereof);

(x) Objective milestones to assess progress toward the implementation of the national market system plan;

(xi) The process by which the plan sponsors solicited views of their members and other appropriate parties regarding the creation, implementation, and maintenance of the consolidated audit trail, a summary of the views of such members and other parties, and how the plan sponsors took such views into account in preparing the national market system plan; and

(xii) Any reasonable alternative approaches to creating, implementing, and maintaining a consolidated audit trail that the plan sponsors considered in developing the national market system plan including, but not limited to, a description of any such alternative approach; the relative advantages and disadvantages of each such alternative, including an assessment of the alternative's costs and benefits; and the basis upon which the plan sponsors selected the approach reflected in the national market system plan.

(2) The national market system plan, or any amendment thereto, filed pursuant to this section shall comply with the requirements in § 242.608(a), if applicable, and be filed with the Commission pursuant to § 242.608.

(3) The national market system plan submitted pursuant to this section shall require each national securities exchange and national securities association to:

(i) Within two months after effectiveness of the national market system plan jointly (or under the governance structure described in the plan) select a person to be the plan processor;

(ii) Within four months after effectiveness of the national market system plan synchronize their business clocks and require members of each such exchange and association to synchronize their business clocks in accordance with paragraph (d) of this section;

(iii) Within one year after effectiveness of the national market system plan provide to the central repository the data specified in paragraph (c) of this section;

(iv) Within fourteen months after effectiveness of the national market system plan implement a new or enhanced surveillance system(s) as required by paragraph (f) of this section;

(v) Within two years after effectiveness of the national market system plan require members of each such exchange and association, except those members that qualify as small broker-dealers as defined in § 240.0–10(c) of this chapter, to provide to the central repository the data specified in paragraph (c) of this section; and

(vi) Within three years after effectiveness of the national market system plan require members of each such exchange and association that qualify as small broker-dealers as defined in § 240.0–10(c) of this chapter to provide to the central repository the data specified in paragraph (c) of this section.

(4) Each national securities exchange and national securities association shall be a sponsor of the national market system plan submitted pursuant to this section and approved by the Commission.

(5) No national market system plan filed pursuant to this section, or any amendment thereto, shall become effective unless approved by the Commission or otherwise permitted in accordance with the procedures set forth in § 242.608. In determining whether to approve the national market system plan, or any amendment thereto, and whether the national market system

plan or any amendment thereto is in the public interest under § 242.608(b)(2), the Commission shall consider the impact of the national market system plan or amendment, as applicable, on efficiency, competition, and capital formation.

(b) *Operation and administration of the national market system plan.*

(1) The national market system plan submitted pursuant to this section shall include a governance structure to ensure fair representation of the plan sponsors, and administration of the central repository, including the selection of the plan processor.

(2) The national market system plan submitted pursuant to this section shall include a provision addressing the requirements for the admission of new sponsors of the plan and the withdrawal of existing sponsors from the plan.

(3) The national market system plan submitted pursuant to this section shall include a provision addressing the percentage of votes required by the plan sponsors to effectuate amendments to the plan.

(4) The national market system plan submitted pursuant to this section shall include a provision addressing the manner in which the costs of operating the central repository will be allocated among the national securities exchanges and national securities associations that are sponsors of the plan, including a provision addressing the manner in which costs will be allocated to new sponsors to the plan.

(5) The national market system plan submitted pursuant to this section shall require the appointment of a Chief Compliance Officer to regularly review the operation of the central repository to assure its continued effectiveness in light of market and technological developments, and make any appropriate recommendations for enhancements to the nature of the information collected and the manner in which it is processed.

(6) The national market system plan submitted pursuant to this section shall include a provision requiring the plan sponsors to provide to the Commission, at least every two years after effectiveness of the national market system plan, a written assessment of the operation of the consolidated audit trail. Such document shall include, at a minimum:

(i) An evaluation of the performance of the consolidated audit trail including, at a minimum, with respect to data accuracy (consistent with paragraph (e)(6) of this section), timeliness of reporting, comprehensiveness of data elements, efficiency of regulatory access, system speed, system downtime,

system security (consistent with paragraph (e)(4) of this section), and other performance metrics to be determined by the Chief Compliance Officer, along with a description of such metrics;

(ii) A detailed plan, based on such evaluation, for any potential improvements to the performance of the consolidated audit trail with respect to any of the following: improving data accuracy; shortening reporting timeframes; expanding data elements; adding granularity and details regarding the scope and nature of Customer-IDs; expanding the scope of the national market system plan to include new instruments and new types of trading and order activities; improving the efficiency of regulatory access; increasing system speed; reducing system downtime; and improving performance under other metrics to be determined by the Chief Compliance Officer;

(iii) An estimate of the costs associated with any such potential improvements to the performance of the consolidated audit trail, including an assessment of the potential impact on competition, efficiency, and capital formation; and

(iv) An estimated implementation timeline for any such potential improvements, if applicable.

(7) The national market system plan submitted pursuant to this section shall include an Advisory Committee which shall function in accordance with the provisions set forth in this paragraph (b)(7). The purpose of the Advisory Committee shall be to advise the plan sponsors on the implementation, operation, and administration of the central repository.

(i) The national market system plan submitted pursuant to this section shall set forth the term and composition of the Advisory Committee, which composition shall include representatives of the member firms of the plan sponsors.

(ii) Members of the Advisory Committee shall have the right to attend any meetings of the plan sponsors, to receive information concerning the operation of the central repository, and to provide their views to the plan sponsors; provided, however, that the plan sponsors may meet without the Advisory Committee members in executive session if, by affirmative vote of a majority of the plan sponsors, the plan sponsors determine that such an executive session is required.

(c) *Data recording and reporting.*

(1) The national market system plan submitted pursuant to this section shall provide for an accurate, time-sequenced

record of orders beginning with the receipt or origination of an order by a member of a national securities exchange or national securities association, and further documenting the life of the order through the process of routing, modification, cancellation, and execution (in whole or in part) of the order.

(2) The national market system plan submitted pursuant to this section shall require each national securities exchange, national securities association, and member to report to the central repository the information required by paragraph (c)(7) of this section in a uniform electronic format, or in a manner that would allow the central repository to convert the data to a uniform electronic format, for consolidation and storage.

(3) The national market system plan submitted pursuant to this section shall require each national securities exchange, national securities association, and member to record the information required by paragraphs (c)(7)(i) through (v) of this section contemporaneously with the reportable event. The national market system plan shall require that information recorded pursuant to paragraphs (c)(7)(i) through (v) of this section must be reported to the central repository by 8:00 a.m. Eastern Time on the trading day following the day such information has been recorded by the national securities exchange, national securities association, or member. The national market system plan may accommodate voluntary reporting prior to 8:00 a.m. Eastern Time, but shall not impose an earlier reporting deadline on the reporting parties.

(4) The national market system plan submitted pursuant to this section shall require each member of a national securities exchange or national securities association to record and report to the central repository the information required by paragraphs (c)(7)(vi) through (viii) of this section by 8:00 a.m. Eastern Time on the trading day following the day the member receives such information. The national market system plan may accommodate voluntary reporting prior to 8:00 a.m. Eastern Time, but shall not impose an earlier reporting deadline on the reporting parties.

(5) The national market system plan submitted pursuant to this section shall require each national securities exchange and its members to record and report to the central repository the information required by paragraph (c)(7) of this section for each NMS security registered or listed for trading on such

exchange or admitted to unlisted trading privileges on such exchange.

(6) The national market system plan submitted pursuant to this section shall require each national securities association and its members to record and report to the central repository the information required by paragraph (c)(7) of this section for each NMS security for which transaction reports are required to be submitted to the association.

(7) The national market system plan submitted pursuant to this section shall require each national securities exchange, national securities association, and any member of such exchange or association to record and electronically report to the central repository details for each order and each reportable event, including, but not limited to, the following information:

(i) For original receipt or origination of an order:

(A) Customer-ID(s) for each customer;

(B) The CAT-Order-ID;

(C) The CAT-Reporter-ID of the broker-dealer receiving or originating the order;

(D) Date of order receipt or origination;

(E) Time of order receipt or origination (using time stamps pursuant to paragraph (d)(3) of this section); and

(F) Material terms of the order.

(ii) For the routing of an order, the following information:

(A) The CAT-Order-ID;

(B) Date on which the order is routed;

(C) Time at which the order is routed (using time stamps pursuant to paragraph (d)(3) of this section);

(D) The CAT-Reporter-ID of the broker-dealer or national securities exchange routing the order;

(E) The CAT-Reporter-ID of the broker-dealer, national securities exchange, or national securities association to which the order is being routed;

(F) If routed internally at the broker-dealer, the identity and nature of the department or desk to which an order is routed; and

(G) Material terms of the order.

(iii) For the receipt of an order that has been routed, the following information:

(A) The CAT-Order-ID;

(B) Date on which the order is received;

(C) Time at which the order is received (using time stamps pursuant to paragraph (d)(3) of this section);

(D) The CAT-Reporter-ID of the broker-dealer, national securities exchange, or national securities association receiving the order;

(E) The CAT-Reporter-ID of the broker-dealer or national securities exchange routing the order; and

(F) Material terms of the order.

(iv) If the order is modified or cancelled, the following information:

(A) The CAT-Order-ID;

(B) Date the modification or cancellation is received or originated;

(C) Time the modification or cancellation is received or originated (using time stamps pursuant to paragraph (d)(3) of this section);

(D) Price and remaining size of the order, if modified;

(E) Other changes in material terms of the order, if modified; and

(F) The CAT-Reporter-ID of the broker-dealer or Customer-ID of the person giving the modification or cancellation instruction.

(v) If the order is executed, in whole or part, the following information:

(A) The CAT-Order-ID;

(B) Date of execution;

(C) Time of execution (using time stamps pursuant to paragraph (d)(3) of this section);

(D) Execution capacity (principal, agency, riskless principal);

(E) Execution price and size;

(F) The CAT-Reporter-ID of the national securities exchange or broker-dealer executing the order; and

(G) Whether the execution was reported pursuant to an effective transaction reporting plan or the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information.

(vi) If the order is executed, in whole or part, the following information:

(A) The account number for any subaccounts to which the execution is allocated (in whole or part);

(B) The CAT-Reporter-ID of the clearing broker or prime broker, if applicable; and

(C) The CAT-Order-ID of any contra-side order(s).

(vii) If the trade is cancelled, a cancelled trade indicator.

(viii) For original receipt or origination of an order, the following information:

(A) Information of sufficient detail to identify the customer; and

(B) Customer account information.

(8) All plan sponsors and their members shall use the same Customer-ID and CAT-Reporter-ID for each customer and broker-dealer.

(d) *Clock synchronization and time stamps.* The national market system plan submitted pursuant to this section shall require:

(1) Each national securities exchange, national securities association, and member of such exchange or association to synchronize its business clocks that are used for the purposes of recording the date and time of any reportable

event that must be reported pursuant to this section to the time maintained by the National Institute of Standards and Technology, consistent with industry standards;

(2) Each national securities exchange and national securities association to evaluate annually the clock synchronization standard to determine whether it should be shortened, consistent with changes in industry standards; and

(3) Each national securities exchange, national securities association, and member of such exchange or association to utilize the time stamps required by paragraph (c)(7) of this section, with at minimum the granularity set forth in the national market system plan submitted pursuant to this section, which shall reflect current industry standards and be at least to the millisecond. To the extent that the relevant order handling and execution systems of any national securities exchange, national securities association, or member of such exchange or association utilize time stamps in increments finer than the minimum required by the national market system plan, the plan shall require such national securities exchange, national securities association, or member to utilize time stamps in such finer increments when providing data to the central repository, so that all reportable events reported to the central repository by any national securities exchange, national securities association, or member can be accurately sequenced. The national market system plan shall require the sponsors of the national market system plan to annually evaluate whether industry standards have evolved such that the required time stamp standard should be in finer increments.

(e) *Central repository.*

(1) The national market system plan submitted pursuant to this section shall provide for the creation and maintenance of a central repository. Such central repository shall be responsible for the receipt, consolidation, and retention of all information reported pursuant to paragraph (c)(7) of this section. The central repository shall store and make available to regulators data in a uniform electronic format, and in a form in which all events pertaining to the same originating order are linked together in a manner that ensures timely and accurate retrieval of the information required by paragraph (c)(7) of this section for all reportable events for that order.

(2) Each national securities exchange, national securities association, and the Commission shall have access to the

central repository, including all systems operated by the central repository, and access to and use of the data reported to and consolidated by the central repository under paragraph (c) of this section, for the purpose of performing its respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations. The national market system plan submitted pursuant to this section shall provide that such access to and use of such data by each national securities exchange, national securities association, and the Commission for the purpose of performing its regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations shall not be limited.

(3) The national market system plan submitted pursuant to this section shall include a provision requiring the creation and maintenance by the plan processor of a method of access to the consolidated data stored in the central repository that includes the ability to run searches and generate reports.

(4) The national market system plan submitted pursuant to this section shall include policies and procedures, including standards, to be used by the plan processor to:

(i) Ensure the security and confidentiality of all information reported to the central repository by requiring that:

(A) All plan sponsors and their employees, as well as all employees of the central repository, agree to use appropriate safeguards to ensure the confidentiality of such data and agree not to use such data for any purpose other than surveillance and regulatory purposes, provided that nothing in this paragraph (e)(4)(i)(A) shall be construed to prevent a plan sponsor from using the data that it reports to the central repository for regulatory, surveillance, commercial, or other purposes as otherwise permitted by applicable law, rule, or regulation;

(B) Each plan sponsor adopt and enforce rules that:

(1) Require information barriers between regulatory staff and non-regulatory staff with regard to access and use of data in the central repository; and

(2) Permit only persons designated by plan sponsors to have access to the data in the central repository;

(C) The plan processor:

(1) Develop and maintain a comprehensive information security program for the central repository, with dedicated staff, that is subject to regular reviews by the Chief Compliance Officer;

(2) Have a mechanism to confirm the identity of all persons permitted to access the data; and

(3) Maintain a record of all instances where such persons access the data; and

(D) The plan sponsors adopt penalties for non-compliance with any policies and procedures of the plan sponsors or central repository with respect to information security.

(ii) Ensure the timeliness, accuracy, integrity, and completeness of the data provided to the central repository pursuant to paragraph (c) of this section; and

(iii) Ensure the accuracy of the consolidation by the plan processor of the data provided to the central repository pursuant to paragraph (c) of this section.

(5) The national market system plan submitted pursuant to this section shall address whether there will be an annual independent evaluation of the security of the central repository and:

(i) If so, provide a description of the scope of such planned evaluation; and

(ii) If not, provide a detailed explanation of the alternative measures for evaluating the security of the central repository that are planned instead.

(6) The national market system plan submitted pursuant to this section shall:

(i) Specify a maximum error rate to be tolerated by the central repository for any data reported pursuant to paragraphs (c)(3) and (c)(4) of this section; describe the basis for selecting such maximum error rate; explain how the plan sponsors will seek to reduce such maximum error rate over time; describe how the plan will seek to ensure compliance with such maximum error rate and, in the event of noncompliance, will promptly remedy the causes thereof;

(ii) Require the central repository to measure the error rate each business day and promptly take appropriate remedial action, at a minimum, if the error rate exceeds the maximum error rate specified in the plan;

(iii) Specify a process for identifying and correcting errors in the data reported to the central repository pursuant to paragraphs (c)(3) and (c)(4) of this section, including the process for notifying the national securities exchanges, national securities association, and members who reported erroneous data to the central repository of such errors, to help ensure that such errors are promptly corrected by the reporting entity, and for disciplining those who repeatedly report erroneous data; and

(iv) Specify the time by which data that has been corrected will be made available to regulators.

(7) The national market system plan submitted pursuant to this section shall require the central repository to collect and retain on a current and continuing basis and in a format compatible with the information consolidated and stored pursuant to paragraph (c)(7) of this section:

(i) Information, including the size and quote condition, on the national best bid and national best offer for each NMS security;

(ii) Transaction reports reported pursuant to an effective transaction reporting plan filed with the Commission pursuant to, and meeting the requirements of, § 242.601; and

(iii) Last sale reports reported pursuant to the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information filed with the Commission pursuant to, and meeting the requirements of, § 242.608.

(8) The national market system plan submitted pursuant to this section shall require the central repository to retain the information collected pursuant to paragraphs (c)(7) and (e)(7) of this section in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention for a period of not less than five years.

(f) *Surveillance.* Every national securities exchange and national securities association subject to this section shall develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the consolidated audit trail.

(g) *Compliance by members.*

(1) Each national securities exchange and national securities association shall file with the Commission pursuant to section 19(b)(2) of the Act (15 U.S.C. 78s(b)(2)) and § 240.19b-4 of this chapter on or before 60 days from approval of the national market system plan a proposed rule change to require its members to comply with the requirements of this section and the national market system plan approved by the Commission.

(2) Each member of a national securities exchange or national securities association shall comply with all the provisions of any approved national market system plan applicable to members.

(3) The national market system plan submitted pursuant to this section shall include a provision requiring each national securities exchange and national securities association to agree to enforce compliance by its members

with the provisions of any approved plan.

(4) The national market system plan submitted pursuant to this section shall include a mechanism to ensure compliance with the requirements of any approved plan by the members of a national securities exchange or national securities association.

(h) *Compliance by national securities exchanges and national securities associations.*

(1) Each national securities exchange and national securities association shall comply with the provisions of the national market system plan approved by the Commission.

(2) Any failure by a national securities exchange or national securities association to comply with the provisions of the national market system plan approved by the Commission shall be considered a violation of this section.

(3) The national market system plan submitted pursuant to this section shall include a mechanism to ensure compliance by the sponsors of the plan with the requirements of any approved plan. Such enforcement mechanism may include penalties where appropriate.

(i) *Other securities and other types of transactions.* The national market system plan submitted pursuant to this section shall include a provision requiring each national securities exchange and national securities association to jointly provide to the Commission within six months after effectiveness of the national market system plan a document outlining how such exchanges and associations could incorporate into the consolidated audit trail information with respect to equity securities that are not NMS securities, debt securities, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities, including details for each order and reportable event that may be required to be provided, which market participants may be required to provide the data, an implementation timeline, and a cost estimate.

(j) *Definitions.* As used in this section:

(1) The term *CAT-Order-ID* shall mean a unique order identifier or series of unique order identifiers that allows the central repository to efficiently and accurately link all reportable events for an order, and all orders that result from the aggregation or disaggregation of such order.

(2) The term *CAT-Reporter-ID* shall mean, with respect to each national securities exchange, national securities association, and member of a national securities exchange or national

securities association, a code that uniquely and consistently identifies such person for purposes of providing data to the central repository.

(3) The term *customer* shall mean:

(i) The account holder(s) of the account at a registered broker-dealer originating the order; and

(ii) Any person from whom the broker-dealer is authorized to accept trading instructions for such account, if different from the account holder(s).

(4) The term *customer account information* shall include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable).

(5) The term *Customer-ID* shall mean, with respect to a customer, a code that uniquely and consistently identifies such customer for purposes of providing data to the central repository.

(6) The term *error rate* shall mean the percentage of reportable events collected by the central repository in which the data reported does not fully and accurately reflect the order event that occurred in the market.

(7) The term *material terms of the order* shall include, but not be limited to, the NMS security symbol; security type; price (if applicable); size (displayed and non-displayed); side (buy/sell); order type; if a sell order, whether the order is long, short, short exempt; open/close indicator; time in force (if applicable); if the order is for a listed option, option type (put/call), option symbol or root symbol, underlying symbol, strike price, expiration date, and open/close; and any special handling instructions.

(8) The term *order* shall include:

(i) Any order received by a member of a national securities exchange or national securities association from any person;

(ii) Any order originated by a member of a national securities exchange or national securities association; or

(iii) Any bid or offer.

(9) The term *reportable event* shall include, but not be limited to, the original receipt or origination, modification, cancellation, routing, and execution (in whole or in part) of an order, and receipt of a routed order.

By the Commission.

Dated: July 18, 2012.

Elizabeth M. Murphy,
Secretary.

Note: The following exhibit will not appear in the Code of Federal Regulations.

Exhibit A

Key to Comment Letters Cited in Adopting Release Proposal To Implement Consolidated Audit Trail (File No. S7-11-10)

1. Letter from Rep. Melissa L. Bean, U.S. Congress, to Mary Schapiro, Chairman, Commission, dated May 20, 2010 (“Bean Letter”).

2. Letter from Norris W. Beach to Elizabeth M. Murphy, Secretary, Commission, dated May 26, 2010 (“Beach Letter”).

3. Letter from Steven Vannelli to Elizabeth M. Murphy, Secretary, Commission, dated May 26, 2010 (“Vannelli Letter”).

4. Letter from Simhan Mandyam, Managing Partner, Triage Life Sciences LLC, to Elizabeth M. Murphy, Secretary, Commission, dated May 26, 2010 (“Triage Letter”).

5. Letter from Paul Drescher, Registered Principal, Foothill Securities, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated May 28, 2010 (“Foothill Letter”).

6. Letter from Chandler Green to Elizabeth M. Murphy, Secretary, Commission, dated June 1, 2010 (“Green Letter”).

7. Letter from Dan T. Nguyen, Wealth Management Company, to Elizabeth M. Murphy, Secretary, Commission, dated June 5, 2010 (“Wealth Management Letter”).

8. Letter from Nicos Anastasopoulos to Elizabeth M. Murphy, Secretary, Commission, dated June 6, 2010 (“Anastasopoulos Letter”).

9. Letter from Ning Wen, Sales Director, Know More Software, Inc., to Heather Seidel, Division of Trading and Markets, Assistant Director, Commission, dated June 9, 2010 (“Know More Letter”).

10. Letter from John McCrary to Elizabeth M. Murphy, Secretary, Commission, dated June 11, 2010 (“McCrary Letter”).

11. Letter from Howard Meyerson, General Counsel, and Vlad Khandros, Market Structure and Public Policy Analyst, Liquidnet, to Elizabeth M. Murphy, Secretary, Commission, dated July 19, 2010 (“Liquidnet Letter”).

12. Letters from Justin S. Magruder, President, Noetic Partners, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated July 22, 2010 and August 3, 2010 (“Noetic Partners Letter I” and “Noetic Partners Letter II”).

13. Letter from Martin Koopman, Director, Aditat, to Elizabeth M. Murphy, Secretary, Commission, dated July 28, 2010 (“Aditat Letter”).

14. Letter from Courtney Doyle McGuinn, FPL Operations Director, FIX Protocol Limited, to Elizabeth M. Murphy, Secretary, Commission, dated August 5, 2010 (“FIX Letter”).

15. Letter from Senator Edward E. Kaufman, U.S. Senate, to Elizabeth M. Murphy, Secretary, Commission, dated August 5, 2010 (“Kaufman Letter”).

16. Letter from Mahesh Kumaraguru to Elizabeth M. Murphy, Secretary, Commission, dated August 5, 2010 (“Kumaraguru Letter”).

17. Letter from R. T. Leuchtkafer to Elizabeth M. Murphy, Secretary,

Commission, dated August 5, 2010 (“Leuchtkafer Letter”).

18. Letter from Horst Simon, Associate Laboratory Director for Computing Sciences and Division Director, Computational Research Department, and David Leinweber, Director, LBNL Center for Innovative Financial Technology Computing Sciences, Lawrence Berkeley National Laboratory, to Elizabeth M. Murphy, Secretary, Commission, dated August 8, 2010 (“Berkeley Letter”).

19. Letter from Peter A. Bloniarz, Dean, College of Computing & Information, University of Albany, George Berg, Associate Professor and Chair, Department of Computer Science, University of Albany, Sandor P. Schuman, Affiliated Faculty, Department of Informatics, University of Albany, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Albany Letter”).

20. Letter from Christopher Nagy, Managing Director Order Strategy, Co-Head Government Relations, and John Markle, Deputy General Counsel, Co-Head Government Relations, TD AMERITRADE, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Ameritrade Letter”).

21. Letter from James J. Angel, Associate Professor of Finance, Georgetown University, Commission, dated August 9, 2010 (“Angel Letter”).

22. Letter from Eric J. Swanson, Senior Vice President and General Counsel, BATS Exchange, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“BATS Letter”).

23. Letter from Anthony D. McCormick, Chief Executive Officer, Boston Options Exchange Group, LLC, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“BOX Letter”).

24. Letter from Charlie J. Marchesani, President Broadridge Financial Solutions, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Broadridge Letter”).

25. Letter from Eric W. Hess, General Counsel, Direct Edge Holdings, LLC, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Direct Edge Letter”).

26. Letter from Marcia E. Asquith, Senior Vice President and Corporate Secretary, FINRA, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“FINRA Letter”).

27. Letter from Marcia E. Asquith, Senior Vice President and Corporate Secretary, FINRA, and Janet McGinness Kissane, Senior Vice President and Corporate Secretary, NYSE Euronext, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“FINRA/NYSE Euronext Letter”).

28. Letter from Ted Myerson, Chief Executive Officer, Doug Kittelsen, Chief Technology Officer, and M. Gary LaFever, General Counsel and Chief Corporate Development Officer, FTEN, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“FTEN Letter”).

29. Letter from Carrie McMillan, General Counsel, Investment Company Institute, to Elizabeth M. Murphy, Secretary,

Commission, dated August 9, 2010 (“ICI Letter”).

30. Letter from Stuart J. Kaswell, Executive Vice President, Managing Director and General Counsel, Managed Funds Association, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Managed Funds Association Letter”).

31. Letter from Dror Segal and Lou Pizzo, Mansfield Consulting, LLC, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Mansfield Letter”).

32. Letter from Andrew C. Small, General Counsel, Scottrade, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Scottrade Letter”).

33. Letter from Devin Wenig, Chief Executive Officer, Markets Division, Thomson Reuters, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Thomson Reuters Letter”).

34. Letter from Jon Feigelson, Senior Vice President, General Counsel and Head of Corporate Governance, TIAA-CREF Individual and Institutional Services, LLC, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“TIAA-CREF Letter”).

35. Letter from Ronald C. Long, Director, Regulatory Affairs, Wells Fargo Advisors, to Elizabeth M. Murphy, Secretary, Commission, dated August 9, 2010 (“Wells Fargo Letter”).

36. Letter from John A. McCarthy, General Counsel, GETCO, to Elizabeth M. Murphy, Secretary, Commission, dated August 10, 2010 (“GETCO Letter”).

37. Letter from Michael Erlanger, Managing Principal, Marketcore, Inc., to Commission, dated August 10, 2010 (“Marketcore Letter”).

38. Letter from Edward J. Joyce, President and Chief Operating Officer, Chicago Board Options Exchange, Inc., to Commission, dated August 11, 2010 (“CBOE Letter”).

39. Letter from Leonard J. Amoruso, Senior Managing Director and General Counsel, Knight Capital Group, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated August 11, 2010 (“Knight Letter”).

40. Letter from Jose Manso, Executive Vice President, Sales and Marketing, Middle Office Solutions LLC, to Commission, dated August 11, 2010 (“Middle Office Letter”).

41. Letter from Manisha Kimmel, Executive Director, Financial Information Forum, to Elizabeth M. Murphy, Secretary, dated August 12, 2010 (“FIF Letter”).

42. Letter from John Harris, Chief Executive Officer, BondMart Technologies, Inc., to Commission, dated August 12, 2010 (“BondMart Letter”).

43. Letter from Joan C. Conley, Senior Vice President and Corporate Secretary, NASDAQ OMX Group, Inc., to Elizabeth M. Murphy, Secretary, dated August 12, 2010 (“Nasdaq Letter I”).

44. Letter from Patrick J. Healy, Chief Executive Officer, Issuer Advisory Group LLC, to Elizabeth M. Murphy, Secretary, Commission, dated August 15, 2010 (“IAG Letter”).

45. Letter from James T. McHale, Managing Director and Associate General Counsel, Securities Industry and Financial Markets Association, to Elizabeth M. Murphy, Secretary, Commission, dated August 17, 2010 (“SIFMA Letter”).

46. Letter from Mike Riley, Chief Executive Officer, Endace Technology Limited, to Elizabeth M. Murphy, Secretary, Commission, dated August 30, 2010 (“Endace Letter”).

47. Letter from Terry Keene, Chief Executive Officer, Integration Systems LLC, to Elizabeth M. Murphy, Secretary, Commission, dated November 12, 2010 (“iSys Letter”).

48. Letter from Bonnie K. Wachtel, Wachtel & Co., Inc., to Elizabeth M. Murphy, Secretary, Commission, dated November 24, 2010 (“Wachtel Letter”).

49. Letter from Richard A. Ross to Elizabeth M. Murphy, Secretary, Commission, dated December 6, 2010 (“Ross Letter”).

50. Letter from James T. McHale, Managing Director and Associated General Counsel, Securities Industry and Financial Markets Association, to David Shillman, Associate Director, Division of Trading and Markets, Commission, dated January 12, 2011 (“SIFMA Drop Copy Letter”).

51. Letter from Daniel J. Connell, Chief Executive Officer, Correlix, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated February 4, 2011 (“Correlix Letter”).

52. Letter from Richard A. Ross, Founder, High Speed Analytics, to Elizabeth M. Murphy, Secretary, Commission, dated February 9, 2011 (“High Speed Letter”).

53. Letter from Michael Belanger, President, Jarg Corporation; Joseph Carrabis, Chief Regulatory Officer and Founder, NextStage Evolution; Wayne Ginion, Vice

President, Enterprise Infrastructure Services; and David Morf, Partner, Senior Regional Economics Advisor, Founding Member, Center for Adaptive Solutions, to Elizabeth M. Murphy, Secretary, Commission, dated April 6, 2011 (“Belanger Letter”) (note, this letter is an amended letter that replaces a letter submitted by the same parties on March 30, 2011).

54. Letter from Richard G. Ketchum, Chairman and Chief Executive Officer, FINRA, to Robert Cook, Director, Division of Trading and Markets, and Carlo DiFlorio, Director, Office of Compliance Inspections and Examinations, Commission, dated April 6, 2011 (“FINRA Proposal Letter”).

55. Letter from Senator Charles E. Schumer, U.S. Senate, to Mary L. Schapiro, Chairman, Commission, dated May 9, 2011 (“Schumer Letter”).

56. Letter from Joan C. Conley, Senior Vice President and Corporate Secretary, NASDAQ OMX Group, Inc., to Elizabeth M. Murphy, Secretary, Commission, dated November 18, 2011 (“Nasdaq Letter II”).

57. Letter from Geraldine M. Lettieri to Elizabeth M. Murphy, Secretary, Commission, dated November 29, 2011 (“Lettieri Letter”).

58. Letter from James T. McHale, Managing Director and Associated General Counsel, Securities Industry and Financial Markets Association, to Robert Cook, Director, Division of Trading and Markets, Commission, dated February 7, 2012 (“SIFMA February 2012 Letter”).

59. Letter from John M. Damgard, President, Futures Industry Association, to Elizabeth M. Murphy, Secretary, Commission, dated February 22, 2012 (“FIA Letter”).

60. Letter from Manisha Kimmel, Executive Director, Financial Information Forum, to Elizabeth M. Murphy, Secretary, Commission, dated March 2, 2012 (“FIF Letter II”).

61. Letter from Jennifer Setzenfand, Chairman, Security Traders Association, dated March 7, 2012 (“STA Letter”).

62. Letter from Dr. Gil Van Bokkelen, Chairman and Chief Executive Officer, Athersys, Inc., to Mary Schapiro, Chairman, Commission, dated March 14, 2012 (“Van Bokkelen Letter”).

[FR Doc. 2012-17918 Filed 7-31-12; 8:45 am]

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EXHIBIT 4

SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-79318; File No. 4-698)

November 15, 2016

Joint Industry Plan; Order Approving the National Market System Plan Governing the
Consolidated Audit Trail

Supplementary Information

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I. Introduction

On February 27, 2015, pursuant to Section 11A of the Securities Exchange Act of 1934 (“Exchange Act” or “Act”)¹ and Rules 608 and 613 of Regulation NMS thereunder,² BATS Exchange, Inc. (n/k/a Bats BZX Exchange, Inc.), BATS-Y Exchange, Inc. (n/k/a Bats BYX Exchange, Inc.), BOX Options Exchange LLC, C2 Options Exchange, Incorporated, Chicago Board Options Exchange, Incorporated, Chicago Stock Exchange, Inc., EDGA Exchange, Inc. (n/k/a Bats EDGA Exchange, Inc.), EDGX Exchange, Inc. (n/k/a Bats EDGX Exchange, Inc.), Financial Industry Regulatory Authority, Inc. (“FINRA”), International Securities Exchange, LLC, ISE Gemini, LLC, Miami International Securities Exchange LLC, NASDAQ OMX BX, Inc. (n/k/a NASDAQ BX, Inc.), NASDAQ OMX PHLX LLC (n/k/a NASDAQ PHLX LLC), The NASDAQ Stock Market LLC, National Stock Exchange, Inc., New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc. (collectively, “self-regulatory organizations”, “SROs” or “Participants”), filed with the Securities and Exchange Commission (“Commission” or “SEC”) a National Market System (“NMS”) Plan Governing the Consolidated Audit Trail (the “CAT NMS Plan,” “CAT Plan” or “Plan”).³ The SROs filed amendments to the CAT NMS Plan

¹ 15 U.S.C. 78k-1.

² 17 CFR 242.608.

³ See Letter from Participants to Brent J. Fields, Secretary, Commission, dated February 27, 2015. Pursuant to Rule 613, the SROs were required to file the CAT NMS Plan on or before April 28, 2013. At the SROs’ request, the Commission granted exemptions to extend the deadline for filing the CAT NMS Plan to December 6, 2013, and then to September 30, 2014. See Securities Exchange Act Release Nos. 69060 (March 7, 2013), 78 FR 15771 (March 12, 2013); 71018 (December 6, 2013), 78 FR 75669 (December 12, 2013). The SROs filed the CAT NMS Plan on September 30, 2014 (the “Initial CAT NMS Plan”). See Letter from the SROs, to Brent J. Fields, Secretary, Commission, dated September 30, 2014. The CAT NMS Plan filed on February 27, 2015, was an amendment to and replacement of the Initial CAT NMS Plan.

on December 24, 2015, and on February 8, 2016.⁴ The CAT NMS Plan, as amended, was published for comment in the Federal Register on May 17, 2016.⁵

The Commission received 24 comment letters in response to the CAT NMS Plan.⁶ On July 29, 2016, the Commission extended the deadline for Commission action on the CAT NMS

⁴ On December 24, 2015, the SROs submitted an Amendment to the CAT NMS Plan. See Letter from Participants to Brent J. Fields, Secretary, Commission, dated December 23, 2015. On February 9, 2016, the Participants filed with the Commission an identical, but unmarked, version of the February 27, 2015 CAT NMS Plan, as modified by the December 24, 2015 Amendment, as well as a copy of the request for proposal issued by the Participants to solicit Bids from parties interested in serving as the Plan Processor for the consolidated audit trail. See Letter from Participants to Brent J. Fields, Secretary, Commission, dated February 8, 2016.

⁵ The Commission voted to publish the February 9, 2016 version of the CAT NMS Plan for public comment on April 27, 2016, and this version of the Plan was published in the Federal Register on May 17, 2016. See Securities Exchange Act Release No. 77724, 81 FR 30614 (the “Notice”). Unless the context otherwise requires, the “CAT NMS Plan” shall refer to the February 27, 2015 CAT NMS Plan, as modified by the December 24, 2015 Amendment and published for comment on May 17, 2016. The Commission notes that the application of ISE Mercury, LLC (“ISE Mercury”) for registration as a national securities exchange was granted on January 29, 2016. See Securities Exchange Act Release No. 76998 (January 29, 2016), 81 FR 6066 (February 4, 2016). In addition, the application of the Investors Exchange LLC (“IEX”) for registration as a national securities exchange was granted on June 17, 2016. See Securities Exchange Act Release No. 78101 (June 17, 2016), 81 FR 41142 (June 23, 2016). ISE Mercury and IEX will become Participants in the CAT NMS Plan and are thus accounted for as Participants for purposes of this Order.

⁶ See Letters to Brent J. Fields, Secretary, Commission, from Kathleen Weiss Hanley, Bolton-Perella Chair in Finance, Lehigh University, et al., dated July 12, 2016 (“Hanley Letter”); Courtney Doyle McGuinn, FIX Operations Director, FIX Trading Community, dated July 14, 2016 (“FIX Trading Letter”); Kelvin To, Founder and President, Data Boiler Technologies, LLC, dated July 15, 2016 (“Data Boiler Letter”); Richard Foster, Senior Vice President and Senior Counsel for Regulatory and Legal Affairs, Financial Services Roundtable, dated July 15, 2016 (“FSR Letter”); David T. Bellaire, Executive Vice President & General Counsel, Financial Services Institute, dated July 18, 2016 (“FSI Letter”); Stuart J. Kaswell, Executive Vice President & Managing Director, General Counsel, Managed Funds Association, dated July 18, 2016 (“MFA Letter”); David W. Blass, General Counsel, Investment Company Institute, dated July 18, 2016 (“ICI Letter”); Larry E. Thompson, Vice Chairman and General Counsel, Depository Trust & Clearing Corporation, dated July 18, 2016 (“DTCC Letter”); Manisha Kimmel,

Plan and designated November 10, 2016 as the new date by which the Commission would be required to take action.⁷ On September 2, 2016, the Participants submitted a response to the comment letters that the Commission received in response to the CAT NMS Plan.⁸ The Participants submitted additional response letters on September 23, 2016 and October 7, 2016.⁹

Chief Regulatory Officer, Wealth Management, Thomson Reuters, dated July 18, 2016 (“TR Letter”); Theodore R. Lazo, Managing Director and Associate General Counsel, and Ellen Greene, Managing Director, Financial Services Operations, Securities Industry and Financial Markets Association, dated July 18, 2016 (“SIFMA Letter”); Anonymous, received July 18, 2016 (“Anonymous Letter I”); Mary Lou Von Kaenel, Managing Director, Financial Information Forum, dated July 18, 2016 (“FIF Letter”); Marc R. Bryant, Senior Vice President, Deputy General Counsel, Fidelity Investments, dated July 18, 2016 (“Fidelity Letter”); Mark Husler, CEO, UnaVista, and Jonathan Jachym, Head of North America Regulatory Strategy & Government Relations, London Stock Exchange Group, dated July 18, 2016 (“UnaVista Letter”); Gary Stone, Chief Strategy Officer for Trading Solutions and Global Regulatory and Policy Group, Bloomberg, L.P., dated July 18, 2016 (“Bloomberg Letter”); Bonnie K. Wachtel, Wachtel Co Inc., dated July 18, 2016 (“Wachtel Letter”); Dennis M. Kelleher, President & CEO, Stephen W. Hall, Legal Director & Securities Specialist, Lev Bagramian, Senior Securities Policy Advisor, Better Markets, dated July 18, 2016 (“Better Markets Letter”); John A. McCarthy, General Counsel, KCG Holdings, Inc., dated July 20, 2016 (“KCG Letter”); Industry Members of the Development Advisory Group (“DAG”) (including Financial Information Forum, Securities Industry and Financial Markets Association and Securities Traders Association), dated July 20, 2016 (“DAG Letter”); Joanne Moffic-Silver, EVP, General Counsel & Corporate Secretary, Chicago Board Options Exchange, Incorporated, dated July 21, 2016 (“CBOE Letter”); Elizabeth K. King, NYSE Group, Inc., dated July 21, 2016 (“NYSE Letter”); James Toes, Securities President & CEO, Securities Traders Association, dated July 25, 2016 (“STA Letter”); Anonymous, received August 12, 2016 (“Anonymous Letter II”); Scott Garrett, Member of Congress, et al., dated October 14, 2016 (“Garrett Letter”). See Exhibit B for a citation key to the comment letters received by the Commission on the proposed CAT NMS Plan.

⁷ See Securities Exchange Act Release No. 78441 (July 29, 2016), 81 FR 51527 (August 4, 2016).

⁸ See Letter from Participants to Brent J. Fields, Secretary, Commission, dated September 2, 2016 (“Response Letter I”).

⁹ See Letters from Participants to Brent J. Fields, Secretary, Commission, dated September 23, 2016 (“Response Letter II”) and October 7, 2016 (“Response Letter III”).

On November 2 and 14, 2016, the Participants submitted additional letters.¹⁰ This Order approves the CAT NMS Plan, with limited changes as described in detail below. The Commission concludes that the Plan, as amended, is necessary and appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanism of a national market system, or is otherwise in furtherance of the purposes of the Act. A copy of the CAT NMS Plan, as adopted, is attached as Exhibit A hereto.

II. Background

The Commission believes that the regulatory data infrastructure on which the SROs and the Commission currently must rely generally is outdated and inadequate to effectively oversee a complex, dispersed, and highly automated national market system. In performing their oversight responsibilities, regulators today must attempt to pull together disparate data from a variety of existing information systems lacking in completeness, accuracy, accessibility, and/or timeliness¹¹—a model that neither supports the efficient aggregation of data from multiple trading venues nor yields the type of complete and accurate market activity data needed for

¹⁰ See Letter from Participants to Brent J. Fields, Secretary, Commission, dated November 2, 2016 (“Participants’ Letter I”); Letter from Participants to Brent J. Fields, Secretary, Commission, dated November 14, 2016 (“Participants’ Letter II”).

¹¹ Completeness refers to whether a data source represents all market activity of interest to regulators, and whether the data is sufficiently detailed to provide the information regulators require. While current data sources provide the trade and order data required by existing rules and regulations, those sources generally do not provide all of the information of interest to regulators in one consolidated audit trail. Accuracy refers to whether the data about a particular order or trade is correct and reliable. Accessibility refers to how the data is stored, how practical it is to assemble, aggregate, and process the data, and whether all appropriate regulators could acquire the data they need. Timeliness refers to when the data is available to regulators and how long it would take to process before it could be used for regulatory analysis. See Adopting Release, *infra* note 14, at 45727.

robust market oversight.

Currently, FINRA and the exchanges maintain their own separate audit trail systems for trading activity, which vary in scope, required data elements and format. In performing their market oversight responsibilities, SRO and Commission Staffs must rely heavily on data from these various SRO audit trails. However, each of these systems has shortcomings in completeness, accuracy, accessibility, or timeliness. Some of these shortcomings are a result of the disparate nature of the systems, which makes it impractical, for example, to follow orders through their entire lifecycle as they may be routed, aggregated, re-routed, and disaggregated across multiple markets. These systems also lack key information useful for regulatory oversight, such as the identity of the customers who originate orders, or that two sets of orders may have been originated by the same customer.¹² Although SRO and Commission Staffs also have access to sources of market activity data other than SRO audit trails, these sources likewise suffer from their own drawbacks.¹³

¹² The Commission notes that the SROs have taken steps in recent years to update their audit trail requirements. For example, NYSE, NYSE Amex LLC (n/k/a “NYSE MKT LLC”) (“NYSE Amex”), and NYSE ARCA, Inc. (“NYSE Arca”) have adopted audit trail rules that coordinate with FINRA’s Order Audit Trail System (“OATS”) requirements. See Securities Exchange Act Release No. 65523 (October 7, 2011), 76 FR 64154 (October 17, 2011) (concerning NYSE); Securities Exchange Act Release No. 65524 (October 7, 2011), 76 FR 64151 (October 17, 2011) (concerning NYSE Amex); Securities Exchange Act Release No. 65544 (October 12, 2011), 76 FR 64406 (October 18, 2011) (concerning NYSE Arca). This allows the SROs to submit their data to FINRA pursuant to a Regulatory Service Agreement (“RSA”), which FINRA can then reformat and combine with OATS data. Despite these efforts, however, significant deficiencies remain. See Notice, supra note 5, at Section IV.D.2.b.

¹³ See Notice, supra note 5, at Section IV.D.2.b (discussing the limitations of current trade and order data systems).

Recognizing these shortcomings, on July 11, 2012, the Commission adopted Rule 613 of Regulation NMS under the Act,¹⁴ which requires the SROs to submit an NMS plan to create, implement, and maintain a consolidated audit trail (“CAT”) that would capture customer and order event information for orders in NMS securities, across all markets, from the time of order inception through routing, cancellation, modification, or execution in a single, consolidated data source.¹⁵ Specifically, Rule 613 requires the Participants to “jointly file ... a national market system plan to govern the creation, implementation, and maintenance of a consolidated audit trail and Central Repository.”¹⁶ The purpose of the Plan, and the creation, implementation and maintenance of a comprehensive audit trail for the U.S. securities markets described therein, is to “substantially enhance the ability of the SROs and the Commission to oversee today’s securities markets and fulfill their responsibilities under the federal securities laws.”¹⁷ As contemplated by Rule 613, the CAT “will allow for the prompt and accurate recording of material information about all orders in NMS securities, including the identity of customers, as these orders are generated and then routed throughout the U.S. markets until execution, cancellation, or modification. This information will be consolidated and made readily available to regulators in a uniform electronic format.”¹⁸

¹⁴ See Securities Exchange Act Release No. 67457 (July 18, 2012), 77 FR 45722 (August 1, 2012) (“Adopting Release”); see also Securities Exchange Act Release No. 62174 (May 26, 2010), 75 FR 32556 (June 8, 2010) (“Proposing Release”).

¹⁵ 17 CFR 242.613(a)(1), (c)(1), (c)(7).

¹⁶ 17 CFR 242.613(a)(1).

¹⁷ See Adopting Release, supra note 14, at 45726.

¹⁸ Id. The Plan also includes certain recording and reporting obligations for OTC Equity Securities.

The SROs filed the CAT NMS Plan pursuant to Rule 613,¹⁹ as modified by exemptive relief granted by the Commission, pursuant to Rule 0-12 under the Act,²⁰ from certain requirements of Rule 613.²¹

The CAT NMS Plan filed by the SROs incorporates the SROs' NMS plan approval process for reviewing, evaluating and ultimately selecting the Plan Processor,²² as set forth in a

¹⁹ See supra note 4.

²⁰ 17 CFR 240.0-12.

²¹ See Securities Exchange Act Release No. 77265 (March 1, 2016), 81 FR 11856 (March 7, 2016) (“Exemption Order”); Letter from Participants to Brent J. Fields, Secretary, Commission, dated January 30, 2015 (“Exemptive Request Letter”). Specifically, the SROs requested exemptive relief from the Rule’s requirements related to: (i) the reporting of Options Market Maker quotations, as required under Rule 613(c)(7)(ii) and (iv); (ii) the reporting and use of the Customer-ID under Rule 613(c)(7)(i)(A), (iv)(F), (viii)(B) and 613(c)(8); (iii) the reporting of the CAT-Reporter-ID, as required under Rule 613(c)(7)(i)(C), (ii)(D), (ii)(E), (iii)(D), (iii)(E), (iv)(F), (v)(F), (vi)(B), and (c)(8); (iv) the linking of executions to specific subaccount allocations, as required under Rule 613(c)(7)(vi)(A); and (v) the timestamp granularity requirement of Rule 613(d)(3) for certain manual order events subject to reporting under Rule 613(c)(7)(i)(E), (ii)(C), (iii)(C) and (iv)(C). On April 3, 2015, the SROs filed a supplement related to the requested exemption for Rule 613(c)(7)(vi)(A). See Letter from Robert Colby, FINRA, on behalf of the SROs, to Brent J. Fields, Secretary, Commission, dated April 3, 2015 (“April 2015 Supplement”). This supplement provided examples of how the proposed relief related to allocations would operate. On September 2, 2015, the SROs filed a second supplement to the Exemptive Request Letter. See Letter from the SROs to Brent J. Fields, Secretary, Commission, dated September 2, 2015 (“September 2015 Supplement”). This supplement to the Exemptive Request Letter further addressed the use of an “effective date” in lieu of a “date account opened.” Unless the context otherwise requires, the “Exemption Request” shall refer to the Exemptive Request Letter, as supplemented by the April 2015 Supplement and the September 2015 Supplement.

²² As set forth in Section 1.1 of the CAT NMS Plan, supra note 5, the Plan Processor “means the Initial Plan Processor or any other Person selected by the Operating Committee pursuant to SEC Rule 613 and Sections 4.3(b)(i) and 6.1 [to] perform the CAT processing functions required by SEC Rule 613 and set forth in [the CAT NMS Plan].” All capitalized terms not otherwise defined herein shall have the meaning ascribed to them in Rule 613, the Adopting Release, or the CAT NMS Plan, as applicable.

separate NMS plan submitted by the SROs and approved by the Commission (the “Selection Plan”).²³ On February 26, 2013, the Participants published a request for proposal (“RFP”) soliciting Bids from parties interested in serving as the Plan Processor.²⁴ As of the publication date of this Order, the Participants, through the process described in the Selection Plan, have narrowed the pool of Bidders to three remaining Shortlisted Bidders.²⁵

The CAT NMS Plan also includes an economic analysis that, as required by Rule 613, was conducted by the SROs. The Commission notes that, in the Adopting Release for Rule 613, the Commission considered the economic effects of the actions the SROs were required to undertake pursuant to Rule 613, specifically the requirement that the SROs develop an NMS plan, utilizing their own resources and undertaking their own research, that addresses the specific

²³ See Securities Exchange Act Release Nos. 70892 (November 15, 2013), 78 FR 69910 (November 21, 2013) (“Selection Plan Notice”); 75192 (June 17, 2015), 80 FR 36028 (June 23, 2015) (Order Approving Amendment No. 1 to the Selection Plan); 75980 (September 24, 2015), 80 FR 58796 (September 30, 2015) (Order Approving Amendment No. 2 to the Selection Plan); 77917 (May 25, 2016), 81 FR 35072 (June 1, 2016) (Notice of Filing and Immediate Effectiveness of Amendment No. 3 to the Selection Plan); 78477 (August 4, 2016), 81 FR 52917 (August 10, 2016) (Notice of Filing and Immediate Effectiveness of Amendment No. 4 to the Selection Plan); see also Securities Exchange Act Release Nos. 71596 (February 21, 2014), 79 FR 11152 (February 27, 2014) (“Selection Plan Approval Order”); 74223 (February 6, 2015), 80 FR 7654 (February 11, 2015) (Notice of Amendment No. 1 to the Selection Plan); 75193 (June 17, 2015), 80 FR 36006 (June 23, 2015) (Notice of Amendment No. 2 to the Selection Plan).

²⁴ See Notice, supra note 5, at 30885-30952 for a complete version of the Consolidated Audit Trail National Market System Plan Request for Proposal (issued February 26, 2013, version 3.0 updated March 4, 2014). Other materials related to the RFP are available at <http://catnmsplan.com/process/>. Among other things, the RFP describes the technical, business, and operational requirements for CAT and outlines the information that must be submitted by Bidders in response to the RFP.

²⁵ “Shortlisted Bidders” were selected by the Selection Committee through the voting and scoring processes described in Section 5.2 of the CAT NMS Plan. See CAT NMS Plan, supra note 5, at Section 1.1; see also Section III.4, infra (describing the selection of the Plan Processor).

details, cost estimates, considerations, and other requirements of the Rule.²⁶ The Commission noted in the Adopting Release that Rule 613 provided the SROs with “flexibility in how they [chose] to meet the requirements of the adopted Rule,”²⁷ allowing the SROs to consider a number of different approaches in developing the CAT NMS Plan. The Commission also noted that “the costs and benefits of creating a consolidated audit trail, and the consideration of specific costs as related to specific benefits, is more appropriately analyzed once the SROs narrow the expanded array of choices they have under the adopted Rule and develop a detailed NMS plan.”²⁸ Accordingly, the Commission required the SROs to conduct an economic analysis and deferred the Commission’s own economic analysis of the actual creation, implementation, and maintenance of the CAT until after submission of the required NMS plan. In accordance with this approach, the Commission included its preliminary analysis and conclusions regarding the economic effects of the CAT NMS Plan when it published the CAT NMS Plan for public comment.

III. Description of the Proposed Plan

The Commission notes that this Section III describes the CAT NMS Plan, as filed by the Participants pursuant to Rule 613 and modified by the Exemption Order,²⁹ that was published for public comment by the Commission.³⁰ Section IV, below, discusses the comments received as

²⁶ See Adopting Release, supra note 14, at 45726.

²⁷ Id. at 45725.

²⁸ See Adopting Release, supra note 14, at 45725.

²⁹ See Exemption Order, supra note 21.

³⁰ See Notice, supra note 5.

well as amendments that the Commission is making to the Plan in light of some of the comments; these amendments are marked against the proposed Plan in Exhibit A to this Order.

1. LLC Agreement

The Participants propose to conduct the activities related to the CAT in a Delaware limited liability company pursuant to a limited liability company agreement, entitled the Limited Liability Company Agreement (“LLC Agreement”) of CAT NMS, LLC (“Company” or “CAT LLC”).³¹ The Participants will jointly own on an equal basis the Company.³² The Company will create, implement and maintain the CAT.³³ The LLC Agreement, itself, including its appendices, is the proposed Plan, which would be a national market system plan as defined in Rule 600(b)(43) of NMS.³⁴

2. Participants

Each national securities exchange and national securities association currently registered with the Commission would be a Participant in the Plan.³⁵ The names and addresses of each Participant are set forth in Exhibit A to the Plan.³⁶ Article III of the Plan provides that any entity approved by the Commission as a national securities exchange or national securities association under the Exchange Act after the Effective Date may become a Participant by submitting to the Company a completed application in the form provided by the Company and satisfying each of the following requirements: (1) executing a counterpart of the LLC Agreement

³¹ Id.

³² See CAT NMS Plan, supra note 5, at Section 3.2(d).

³³ Id. at Section 2.6.

³⁴ See Notice, supra note 5, at 30618.

³⁵ Id.

³⁶ See CAT NMS Plan, supra note 5, at Section 3.1.

as then in effect; and (2) paying a fee to the Company in an amount determined by a Majority Vote³⁷ of the Operating Committee as fairly and reasonably compensating the Company and the Participants for costs incurred in creating, implementing and maintaining the CAT (including such costs incurred in evaluating and selecting the Initial Plan Processor³⁸ and any subsequent Plan Processor) and for costs the Company incurs in providing for the prospective Participant's participation in the Company, including after consideration of certain factors identified in Section 3.3(b) of the Agreement ("Participation Fee").³⁹ Amendment of the Plan reflecting the admission of a new Participant will be effective only when: (1) it is approved by the SEC in accordance with Rule 608 or otherwise becomes effective pursuant to Rule 608; and (2) the prospective Participant pays the Participation Fee.⁴⁰

A number of factors are relevant to the determination of a Participation Fee.⁴¹ Such factors are: (1) the portion of costs previously paid by the Company for the development, expansion and maintenance of the CAT which, under generally accepted accounting principles ("GAAP"), would have been treated as capital expenditures and would have been amortized over

³⁷ "Majority Vote" means the affirmative vote of at least a majority of all of the members of the Operating Committee or any Subcommittee, as applicable, authorized to cast a vote with respect to a matter presented for a vote (whether or not such a member is present at any meeting at which a vote is taken) by the Operating Committee or any Subcommittee, as applicable (excluding, for the avoidance of doubt, any member of the Operating Committee or any Subcommittee, as applicable, that is recused or subject to a vote to recuse from such matter pursuant to Section 4.3(d) of the CAT NMS Plan). See CAT NMS Plan, supra note 5, at Section 1.1.

³⁸ The "Initial Plan Processor" means the first Plan Processor selected by the Operating Committee in accordance with Rule 613, Section 6.1 and the Selection Plan. See CAT NMS Plan, supra note 5, at Section 1.1.

³⁹ Id. at Section 3.3(a).

⁴⁰ Id. at Section 3.3(a)–(b).

⁴¹ See Notice, supra note 5, at 30618.

the five years preceding the admission of the prospective Participant; (2) an assessment of costs incurred and to be incurred by the Company for modifying the CAT or any part thereof to accommodate the prospective Participant, which costs are not otherwise required to be paid or reimbursed by the prospective Participant; (3) Participation Fees paid by other Participants admitted as such after the Effective Date; (4) elapsed time from the Effective Date to the anticipated date of admittance of the prospective Participant; and (5) such other factors, if any, as may be determined to be appropriate by the Operating Committee and approved by the Commission.⁴² In the event that the Company and a prospective Participant do not agree on the amount of the Participation Fee, such amount will be subject to review by the SEC pursuant to Section 11A(b)(5) of the Exchange Act.⁴³

An applicant for participation in the Company may apply for limited access to the CAT System⁴⁴ for planning and testing purposes pending its admission as a Participant by submitting to the Company a completed Application for Limited Access to the CAT System in a form provided by the Company, accompanied by payment of a deposit in the amount established by the Company, which will be applied or refunded as described in such application.⁴⁵ To be eligible to apply for such limited access, the applicant must have been approved by the SEC as a

⁴² See CAT NMS Plan, supra note 5, at Section 3.3(b).

⁴³ Id.; see also Exchange Act Section 11A(b)(2), 15 U.S.C. 78k-1(b)(5) (which provides that a prohibition or limitation on access to services by a registered securities information processor must be reviewed by the Commission upon application by an aggrieved person).

⁴⁴ “CAT System” means all data processing equipment, communications facilities, and other facilities, including equipment, utilized by the Company or any third parties acting on the Company’s behalf in connection with operation of the CAT and any related information or relevant systems pursuant to the LLC Agreement. See CAT NMS Plan, supra note 5, at Section 1.1.

⁴⁵ Id. at Section 3.3(c).

national securities exchange or national securities association under the Exchange Act but the applicant has not yet become a Participant of the Plan, or the SEC must have published such applicant's Form 1 Application or Form X-15AA-1 Application to become a national securities exchange or a national securities association, respectively.⁴⁶

All Company Interests will have the same rights, powers, preferences and privileges and be subject to the same restrictions, qualifications and limitations.⁴⁷ Once admitted, each Participant will be entitled to one vote on any matter presented to Participants for their consideration and to participate equally in any distribution made by the Company (other than a distribution made pursuant to Section 10.2 of the Plan).⁴⁸ Each Participant will have a Company Interest equal to that of each other Participant.⁴⁹

Article III also describes a Participant's ability to Transfer a Company Interest. A Participant may only Transfer any Company Interest to a national securities exchange or national securities association that succeeds to the business of such Participant as a result of a merger or consolidation with such Participant or the Transfer of all or substantially all of the assets or equity of such Participant ("Permitted Transferee").⁵⁰ A Participant may not Transfer any Company Interest to a Permitted Transferee unless: (1) such Permitted Transferee executes a

⁴⁶

Id.

⁴⁷

Id. at Section 3.2(a).

⁴⁸

Id. at Sections 3.2(b), 10.2.

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Id. at Section 3.2(d).

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Id. at Section 3.4(b).

counterpart of the Plan; and (2) the amendment to the Plan reflecting the Transfer is approved by the SEC in accordance with Rule 608 or otherwise becomes effective pursuant to Rule 608.⁵¹

In addition, Article III addresses the voluntary resignation and termination of participation in the Plan. Any Participant may voluntarily resign from the Company, and thereby withdraw from and terminate its right to any Company Interest, only if: (1) a Permitted Legal Basis⁵² for such action exists; and (2) such Participant provides to the Company and each other Participant no less than thirty days prior to the effective date of such action written notice specifying such Permitted Legal Basis, including appropriate documentation evidencing the existence of such Permitted Legal Basis, and, to the extent applicable, evidence reasonably satisfactory to the Company and other Participants that any orders or approvals required from the SEC in connection with such action have been obtained.⁵³ A validly withdrawing Participant will have the rights and obligations discussed below with regard to termination of participation.⁵⁴

A Participant's participation in the Company, and its right to any Company Interest, will terminate as of the earliest of: (1) the effective date specified in a valid resignation notice; (2) such time as such Participant is no longer registered as a national securities exchange or national securities association; or (3) the date of termination for failure to pay fees.⁵⁵ With regard to the payment of fees, each Participant is required to pay all fees or other amounts

⁵¹ Id. at Section 3.4(c).

⁵² "Permitted Legal Basis" means the Participant has become exempt from, or otherwise has ceased to be subject to, Rule 613 or has arranged to comply with Rule 613 in some manner other than through participation in the LLC Agreement, in each instance subject to the approval of the Commission. See CAT NMS Plan, supra note 5, at Section 1.1.

⁵³ Id. at Section 3.6.

⁵⁴ Id. at Sections 3.6, 3.7.

⁵⁵ Id. at Section 3.7(a).

required to be paid under the Plan within thirty days after receipt of an invoice or other notice indicating payment is due (unless a longer payment period is otherwise indicated) (the “Payment Date”).⁵⁶ If a Participant fails to make such a required payment by the Payment Date, any balance in the Participant’s Capital Account will be applied to the outstanding balance.⁵⁷ If a balance still remains with respect to any such required payment, the Participant will pay interest on the outstanding balance from the Payment Date until such fee or amount is paid at a per annum rate equal to the lesser of: (1) the Prime Rate plus 300 basis points; or (2) the maximum rate permitted by applicable law.⁵⁸ If any such remaining outstanding balance is not paid within thirty days after the Payment Date, the Participants will file an amendment to the Plan requesting the termination of the participation in the Company of such Participant, and its right to any Company Interest, with the SEC.⁵⁹ Such amendment will be effective only when it is approved by the SEC in accordance with Rule 608 or otherwise becomes effective pursuant to Rule 608.⁶⁰

From and after the effective date of termination of a Participant’s participation in the Company, profits and losses of the Company will cease to be allocated to the Capital Account of the Participant.⁶¹ A terminated Participant will be entitled to receive the balance in its Capital Account as of the effective date of termination adjusted for profits and losses through that date, payable within ninety days of the effective date of termination, and will remain liable for its proportionate share of costs and expenses allocated to it for the period during which it was a

⁵⁶ Id. at Section 3.7(b).

⁵⁷ Id.

⁵⁸ Id.

⁵⁹ Id.

⁶⁰ Id.

⁶¹ Id. at Section 3.7(c).

Participant, for obligations under Section 3.8(c) regarding the return of amounts previously distributed (if required by a court of competent jurisdiction), for its indemnification obligations pursuant to Section 4.1, and for obligations under Section 9.6 regarding confidentiality, but it will have no other obligations under the Plan following the effective date of termination.⁶² The Plan will be amended to reflect any termination of participation in the Company of a Participant, provided that such amendment will be effective only when it is approved by the SEC in accordance with Rule 608 or otherwise becomes effective pursuant to Rule 608.⁶³

3. Management

Article IV of the Plan establishes the overall governance structure for the management of the Company. Specifically, the Participants propose that the Company be managed by an Operating Committee.⁶⁴

The Operating Committee will consist of one voting member representing each Participant and one alternate voting member representing each Participant who will have a right to vote only in the absence of the Participant's voting member of the Operating Committee.⁶⁵ Each of the voting and alternate voting members of the Operating Committee will be appointed by the Participant that he or she represents, will serve at the will of the Participant appointing such member and will be subject to the confidentiality obligations of the Participant that he or

⁶² Id.

⁶³ Id.

⁶⁴ The Operating Committee will manage the Company except for situations in which the approval of the Participants is required by the Plan or by non-waivable provisions of applicable law. See CAT NMS Plan, supra note 5, at Article IV.

⁶⁵ Id. at Section 4.2(a).

she represents as set forth in Section 9.6.⁶⁶ One individual may serve as the voting member of the Operating Committee for multiple Affiliated Participants, and such individual will have the right to vote on behalf of each such Affiliated Participant.⁶⁷

The Operating Committee will elect, by Majority Vote, one of its members to act as Chair for a term of two years.⁶⁸ No Person may serve as Chair for more than two successive full terms, and no Person then appointed to the Operating Committee by a Participant that then serves, or whose Affiliate then serves, as the Plan Processor will be eligible to serve as the Chair.⁶⁹ The Chair will preside at all meetings of the Operating Committee, designate a Person to act as Secretary, and perform such other duties and possess such other powers as the Operating Committee may from time to time prescribe.⁷⁰ The Chair will not be entitled to a tie-breaking vote at any meeting of the Operating Committee.⁷¹

Each of the members of the Operating Committee, including the Chair, will be authorized to cast one vote for each Participant that he or she represents on all matters voted upon by the Operating Committee.⁷² Action of the Operating Committee will be authorized by Majority Vote (except under certain designated circumstances), subject to the approval of the SEC

⁶⁶ Id. at Sections 4.2(a), 9.6.

⁶⁷ Id. at Section 4.2(a). An “Affiliated Participant” means any Participant controlling, controlled by, or under common control with another Participant. Id. at Section 1.1.

⁶⁸ Id. at Section 4.2(b).

⁶⁹ Id.

⁷⁰ Id.

⁷¹ Id.

⁷² Id. at Section 4.3(a).

whenever such approval is required under the Exchange Act and the rules thereunder.⁷³ For example, the Plan specifically notes that a Majority Vote of the Operating Committee is required to: (1) select the Chair; (2) select the members of the Advisory Committee (as described below); (3) interpret the Plan (unless otherwise noted therein); (4) approve any recommendation by the Chief Compliance Officer (“CCO”) pursuant to Section 6.2(a)(v)(A); (5) determine to hold an Executive Session of the Operating Committee; (6) determine the appropriate funding-related policies, procedures and practices consistent with Article XI; and (7) act upon any other matter specified elsewhere in the Plan (which includes the Appendices to the Plan) as requiring a vote, approval or other action of the Operating Committee (other than those matters expressly requiring a Supermajority Vote or a different vote of the Operating Committee).⁷⁴

Article IV requires a Supermajority Vote⁷⁵ of the Operating Committee, subject to the approval of the SEC when required, for the following: (1) selecting a Plan Processor, other than the Initial Plan Processor selected in accordance with Article V of the Plan; (2) terminating the Plan Processor without cause in accordance with Section 6.1(q); (3) approving the Plan Processor’s appointment or removal of the Chief Information Security Officer (“CISO”), CCO, or any Independent Auditor in accordance with Section 6.1(b); (4) entering into, modifying or

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Id.

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Id.

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“Supermajority Vote” means the affirmative vote of at least two-thirds of all of the members of the Operating Committee or any Subcommittee, as applicable, authorized to cast a vote with respect to a matter presented for a vote (whether or not such a member is present at any meeting at which a vote is taken) by the Operating Committee or any Subcommittee, as applicable (excluding, for the avoidance of doubt, any member of the Operating Committee or any Subcommittee, as applicable, that is recused or subject to a vote to recuse from such matter pursuant to Section 4.3(d)); provided that if two-thirds of all of such members authorized to cast a vote is not a whole number then that number shall be rounded up to the nearest whole number. Id. at Section 1.1.

terminating any Material Contract (if the Material Contract is with a Participant or an Affiliate of a Participant, such Participant and Affiliated Participant will be recused from any vote); (5) making any Material Systems Change; (6) approving the initial Technical Specifications or any Material Amendment to the Technical Specifications proposed by the Plan Processor; (7) amending the Technical Specifications on its own motion; and (8) acting upon any other matter specified elsewhere in the Plan (which includes the Appendices to the Plan) as requiring a vote, approval or other action of the Operating Committee by a Supermajority Vote.⁷⁶

A member of the Operating Committee or any Subcommittee thereof (as discussed below) shall recuse himself or herself from voting on any matter under consideration by the Operating Committee or such Subcommittee if such member determines that voting on such matter raises a Conflict of Interest.⁷⁷ In addition, if the members of the Operating Committee or any Subcommittee (excluding the member thereof proposed to be recused) determine by Supermajority Vote that any member voting on a matter under consideration by the Operating Committee or such Subcommittee raises a Conflict of Interest, such member shall be recused from voting on such matter.⁷⁸ No member of the Operating Committee or any Subcommittee will be automatically recused from voting on any matter except matters involving Material Contracts as discussed in the prior paragraph, as otherwise specified in the Plan, and as follows:

(1) if a Participant is a Bidding Participant⁷⁹ whose Bid remains under consideration, members

⁷⁶ Id. at Section 4.3(b).

⁷⁷ Id. at Section 4.3(d).

⁷⁸ Id.

⁷⁹ “Bidding Participant” means a Participant that: (a) submits a Bid; (b) is an Affiliate of an entity that submits a Bid; or (c) is included, or is an Affiliate of an entity that is included, as a Material Subcontractor as part of a Bid. Id. at Section 1.1.

appointed to the Operating Committee or any Subcommittee by such Participant or any of its Affiliated Participants will be recused from any vote concerning: (a) whether another Bidder may revise its Bid; (b) the selection of a Bidder; or (c) any contract to which such Participant or any of its Affiliates would be a party in its capacity as Plan Processor; and (2) if a Participant is then serving as Plan Processor, is an Affiliate of the Person then serving as Plan Processor, or is an Affiliate of an entity that is a Material Subcontractor to the Plan Processor, then in each case members appointed to the Operating Committee or any Subcommittee by such Participant or any of its Affiliated Participants shall be recused from any vote concerning: (a) the proposed removal of such Plan Processor; or (b) any contract between the Company and such Plan Processor.⁸⁰

Article IV also addresses meetings of the Operating Committee.⁸¹ Meetings of the Operating Committee may be attended by each Participant's voting Representative and its alternate voting Representative and by a maximum of two nonvoting Representatives of each Participant, by members of the Advisory Committee, by the CCO, by other Representatives of the Company and the Plan Processor, by Representatives of the SEC and by such other Persons that the Operating Committee may invite to attend.⁸² The Operating Committee, however, may, where appropriate, determine to meet in Executive Session during which only voting members of

⁸⁰ Id. at Section 4.3(d).

⁸¹ Article IV also addresses, among other things, different types of Operating Committee meetings (regular, special and emergency), frequency of such meetings, how to call such meetings, the location of the meetings, the role of the Chair, and notice regarding such meetings. Id. at Section 4.4.

⁸² Id. at Section 4.4(a).

the Operating Committee will be present.⁸³ The Operating Committee, however, may invite other Representatives of the Participants, of the Company, of the Plan Processor (including the CCO and the CISO) or the SEC, or such other Persons that the Operating Committee may invite to attend, to be present during an Executive Session.⁸⁴ Any determination of the Operating Committee to meet in an Executive Session will be made upon a Majority Vote and will be reflected in the minutes of the meeting.⁸⁵ In addition, any Person that is not a Participant but for which the SEC has published a Form 1 Application or Form X-15AA-1 to become a national securities exchange or national securities association, respectively, will be permitted to appoint one primary Representative and one alternate Representative to attend regularly scheduled Operating Committee meetings in the capacity of a non-voting observer, but will not be permitted to have any Representative attend a special meeting, emergency meeting or meeting held in Executive Session of the Operating Committee.⁸⁶

The Operating Committee may, by Majority Vote, designate by resolution one or more Subcommittees it deems necessary or desirable in furtherance of the management of the business and affairs of the Company.⁸⁷ For any Subcommittee, any member of the Operating Committee who wants to serve thereon may so serve.⁸⁸ If Affiliated Participants have collectively appointed one member to the Operating Committee to represent them, then such Affiliated Participants may have only that member serve on the Subcommittee or may decide not to have only that

83 Id.

84 Id.

85 Id.

86 Id. at Section 4.4(b).

87 Id. at Section 4.12(a).

88 Id.

collectively appointed member serve on the Subcommittee.⁸⁹ Such member may designate an individual other than himself or herself who is also an employee of the Participant or Affiliated Participants that appointed such member to serve on a Subcommittee in lieu of the particular member.⁹⁰ Subject to the requirements of the Plan and non-waivable provisions of Delaware law, a Subcommittee may exercise all the powers and authority of the Operating Committee in the management of the business and affairs of the Company as so specified in the resolution of the Operating Committee designating such Subcommittee.⁹¹

Article IV requires that the Operating Committee maintain a Compliance Subcommittee for the purpose of aiding the CCO as necessary, including with respect to issues involving: (1) the maintenance of the confidentiality of information submitted to the Plan Processor or Central Repository pursuant to Rule 613, applicable law, or the Plan by Participants and Industry Members; (2) the timeliness, accuracy, and completeness of information submitted pursuant to Rule 613, applicable law or the Plan by Participants and Industry Members; and (3) the manner and extent to which each Participant is meeting its obligations under Rule 613, Section 3.11, and as set forth elsewhere in the Plan and ensuring the consistency of the Plan's enforcement as to all Participants.⁹²

Article IV also sets forth the requirements for the formation and functioning of an Advisory Committee, which will advise the Participants on the implementation, operation and

⁸⁹ Id.

⁹⁰ Id.

⁹¹ Id.

⁹² Id. at Section 4.12(b).

administration of the Central Repository, including possible expansion of the Central Repository to other securities and other types of transactions.⁹³

Article IV describes the composition of the Advisory Committee. No member of the Advisory Committee may be employed by or affiliated with any Participant or any of its Affiliates or facilities.⁹⁴ The Operating Committee will select one member from representatives of each of the following categories to serve on the Advisory Committee on behalf of himself or herself individually and not on behalf of the entity for which the individual is then currently employed: (1) a broker-dealer with no more than 150 Registered Persons; (2) a broker-dealer with at least 151 and no more than 499 Registered Persons; (3) a broker-dealer with 500 or more Registered Persons; (4) a broker-dealer with a substantial wholesale customer base; (5) a broker-dealer that is approved by a national securities exchange: (a) to effect transactions on an exchange as a specialist, market maker or floor broker; or (b) to act as an institutional broker on an exchange; (6) a proprietary-trading broker-dealer; (7) a clearing firm; (8) an individual who maintains a securities account with a registered broker or dealer but who otherwise has no material business relationship with a broker or dealer or with a Participant; (9) a member of academia with expertise in the securities industry or any other industry relevant to the operation of the CAT System; (10) an institutional investor trading on behalf of a public entity or entities; (11) an institutional investor trading on behalf of a private entity or entities; and (12) an individual with significant and reputable regulatory expertise.⁹⁵ The individuals selected to represent categories (1) through (12) above must include, in the aggregate, representatives of no

⁹³ Id. at Section 4.13(a), (d).

⁹⁴ Id. at Section 4.13(b).

⁹⁵ Id.

fewer than three broker-dealers that are active in the options business and representatives of no fewer than three broker-dealers that are active in the equities business.⁹⁶ In addition, upon a change in employment of any such Advisory Committee member, a Majority Vote of the Operating Committee will be required for such member to be eligible to continue to serve on the Advisory Committee.⁹⁷ Furthermore, the SEC's Chief Technology Officer (or the individual then currently employed in a comparable position providing equivalent services) will serve as an observer of the Advisory Committee (but not be a member).⁹⁸ The members of the Advisory Committee will have a term of three years.⁹⁹

Members of the Advisory Committee will have the right to attend meetings of the Operating Committee or any Subcommittee, to receive information concerning the operation of the Central Repository, and to submit their views to the Operating Committee or any Subcommittee on matters pursuant to the Plan prior to a decision by the Operating Committee on such matters.¹⁰⁰ A member of the Advisory Committee will not have a right to vote on any matter considered by the Operating Committee or any Subcommittee.¹⁰¹ In addition, the Operating Committee or any Subcommittee may meet in Executive Session if the Operating Committee or Subcommittee determines by Majority Vote that such an Executive Session is

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Id.

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Id.

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Id.

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Four of the initial twelve members of the Advisory Committee will have an initial term of one year, and another four of the initial twelve members of the Advisory Committee will have an initial term of two years. Id. at Section 4.13(c).

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Id. at Section 4.13(d).

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Id.

advisable.¹⁰² The Operating Committee may solicit and consider views of other stakeholders on the operation of the Central Repository in addition to those of the Advisory Committee.¹⁰³

Although members of the Advisory Committee will have the right to receive information concerning the operation of the Central Repository, the Operating Committee retains the authority to determine the scope and content of information supplied to the Advisory Committee, which will be limited to that information that is necessary and appropriate for the Advisory Committee to fulfill its functions.¹⁰⁴ Any information received by members of the Advisory Committee will remain confidential unless otherwise specified by the Operating Committee.¹⁰⁵

Article IV also describes the appointment of Officers for the Company. Specifically, the CCO and the CISO, each of whom will be employed solely by the Plan Processor and neither of whom will be deemed or construed in any way to be an employee of the Company, will be Officers of the Company.¹⁰⁶ Neither such Officer will receive or be entitled to any compensation from the Company or any Participant by virtue of his or her service in such capacity (other than if a Participant is then serving as the Plan Processor, compensation paid to such Officer as an employee of such Participant).¹⁰⁷ Each such Officer will report directly to the Operating Committee.¹⁰⁸ The CCO will work on a regular and frequent basis with the Compliance Subcommittee and/or other Subcommittees as may be determined by the Operating

¹⁰² See Notice, supra note 5, at 30621 n.54.

¹⁰³ Id.

¹⁰⁴ See CAT NMS Plan, supra note 5, at Section 4.13(e).

¹⁰⁵ Id.

¹⁰⁶ Id. at Section 4.6(a).

¹⁰⁷ Id.

¹⁰⁸ Id.

Committee.¹⁰⁹ Except to the extent otherwise provided in the Plan, including Section 6.2, each such Officer will have such fiduciary and other duties with regard to the Plan Processor as imposed by the Plan Processor on such individual by virtue of his or her employment by the Plan Processor.¹¹⁰

In addition, the Plan Processor will inform the Operating Committee of the individual who has direct management responsibility for the Plan Processor's performance of its obligations with respect to the CAT.¹¹¹ Subject to approval by the Operating Committee of such individual, the Operating Committee will appoint such individual as an Officer.¹¹² In addition, the Operating Committee by Supermajority Vote may appoint other Officers as it shall from time to time deem necessary.¹¹³ Any Officer appointed pursuant to Section 4.6(b) will have only such duties and responsibilities as set forth in the Plan, or as the Operating Committee shall from time to time expressly determine.¹¹⁴ No such Officer shall have any authority to bind the Company (which authority is vested solely in the Operating Committee) or be an employee of the Company, unless in each case the Operating Committee, by Supermajority Vote, expressly determines otherwise.¹¹⁵ No person subject to a "statutory disqualification" (as defined in

¹⁰⁹ Id.

¹¹⁰ Id. at Sections 4.6(a), 6.2.

¹¹¹ Id. at Section 4.6(b).

¹¹² Id.

¹¹³ Id.

¹¹⁴ Id.

¹¹⁵ Id.

Section 3(a)(39) of the Exchange Act) may serve as an Officer.¹¹⁶ It is the intent of the Participants that the Company have no employees.¹¹⁷

4. Initial Plan Processor Selection

Article V of the Plan sets forth the process for the Participants' evaluation of Bids and the selection process for narrowing down the Bids and choosing the Initial Plan Processor.¹¹⁸ The initial steps in the evaluation and selection process were and will be performed pursuant to the Selection Plan; the final two rounds of evaluation and voting, as well as the final selection of the Initial Plan Processor, will be performed pursuant to the Plan.¹¹⁹

As discussed above, the Selection Committee has selected the Shortlisted Bids pursuant to the Selection Plan. After reviewing the Shortlisted Bids, the Participants have identified the optimal proposed solutions for the CAT and, to the extent possible, included such solutions in the Plan.¹²⁰ The Selection Committee will determine, by majority vote, whether Shortlisted

¹¹⁶ Id. The Plan uses the term “statutory disqualification” as defined in Section 3(a)(39) of the Exchange Act, which addresses disqualification from membership or participation in, or association with a member of, an SRO. While Officers of the Plan are not persons associated with a member of an SRO, the Commission interprets this provision of the Plan to mean that no person that is subject to one of the statutory disqualifications set forth in Sections 3(a)(39)(A) through (F) of the Exchange Act may serve as Officer.

¹¹⁷ See CAT NMS Plan, supra note 5, at Section 4.6(b).

¹¹⁸ The Plan Processor selection process set forth in the CAT NMS Plan is identical to the post-CAT NMS Plan approval selection process set forth in the Selection Plan. See Selection Plan, supra note 23.

¹¹⁹ By its terms, the Selection Plan will terminate upon Commission approval of the Plan. Id.

¹²⁰ As noted above, the Participants stated their belief that certain exemptive relief is necessary to include in the Plan all of the provisions the Participants believe are part of the optimal solution for the CAT. The Commission notes that the request for exemptive relief was granted on March 1, 2016. See Exemption Order, supra note 21.

Bidders will have the opportunity to revise their Bids.¹²¹ To reduce potential conflicts of interest, no Bidding Participant may vote on whether a Shortlisted Bidder will be permitted to revise its Bid if a Bid submitted by or including the Participant or an Affiliate of the Participant is a Shortlisted Bid.¹²² The Selection Committee will review and evaluate all Shortlisted Bids, including any permitted revisions submitted by Shortlisted Bidders.¹²³ In performing this review and evaluation, the Selection Committee may consult with the Advisory Committee and such other Persons as the Selection Committee deems appropriate, which may include the DAG until the Advisory Committee is formed.¹²⁴

After receipt of any permitted revisions, the Selection Committee will select the Initial Plan Processor from the Shortlisted Bids in two rounds of voting where each Participant has one vote via its Voting Senior Officer in each round.¹²⁵ No Bidding Participant, however, will be entitled to vote in any round if the Participant's Bid, a Bid submitted by an Affiliate of the Participant, or a Bid including the Participant or an Affiliate of the Participant is considered in such round.¹²⁶ In the first round, each Voting Senior Officer, subject to the recusal provision in Section 5.2(e)(ii), will select a first and second choice, with the first choice receiving two points

¹²¹ See CAT NMS Plan, supra note 5, at Section 5.2(c)(ii).

¹²² Id. at Section 5.1(b)(ii).

¹²³ Id.

¹²⁴ Id.

¹²⁵ See Notice, supra note 5, at 30623. If the proposed amendment to the Selection Plan is approved, the Selection Committee may determine to narrow the number of Shortlisted Bids prior to the two rounds of voting. Id. at 30623 n.58.

¹²⁶ This recusal provision is included in the Plan, as well as in an amendment to the Selection Plan. See Order Approving Amendment No. 2 to the Selection Plan, supra note 23.

and the second choice receiving one point.¹²⁷ The two Shortlisted Bids receiving the highest cumulative scores in the first round will advance to the second round.¹²⁸ In the event of a tie, the tie will be broken by assigning one point per vote to the tied Shortlisted Bids, and the Shortlisted Bid with the most votes will advance.¹²⁹ If this procedure fails to break the tie, a revote will be taken on the tied Bids with each vote receiving one point.¹³⁰ If the tie persists, the Participants will identify areas for discussion, and revotes will be taken until the tie is broken.¹³¹

Once two Shortlisted Bids have been chosen, the Voting Senior Officers of the Participants (other than those subject to recusal) will vote for a single Shortlisted Bid from the final two to determine the Initial Plan Processor.¹³² If the tie persists, the Participants will identify areas for discussion and, following these discussions, revotes will be taken until the tie is broken.¹³³ As set forth in Article VI of the Plan, following the selection of the Initial Plan Processor, the Participants will file with the Commission a statement identifying the Initial Plan Processor and including the information required by Rule 608.¹³⁴

5. Functions and Activities of the CAT System

a. Plan Processor

Article VI describes the responsibilities of the selected Plan Processor. The Company,

¹²⁷ See CAT NMS Plan, supra note 5, at Section 5.2(e)(iii)(A).

¹²⁸ Id. at Section 5.2(e)(iii)(C). Each round of voting throughout the Plan is independent of other rounds. See Notice, supra note 5, at 30623 n.60.

¹²⁹ See CAT NMS Plan, supra note 5, at Section 5.2(e)(iii)(D).

¹³⁰ Id.

¹³¹ Id.

¹³² Id. at Section 5.2(e)(iii)(E).

¹³³ Id.

¹³⁴ Id. at Section 6.7(a)(i).

under the direction of the Operating Committee, will enter into one or more agreements with the Plan Processor obligating the Plan Processor to perform the functions and duties contemplated by the Plan to be performed by the Plan Processor, as well as such other functions and duties the Operating Committee deems necessary or appropriate.¹³⁵

As set forth in the Plan, the Plan Processor is required to develop and, with the prior approval of the Operating Committee, implement policies, procedures, and control structures related to the CAT System that are consistent with Rule 613(e)(4), Appendix C and Appendix D.¹³⁶ The Plan Processor will: (1) comply with applicable provisions of 15 U.S. Code §78u-6 (Securities Whistleblower Incentives and Protection) and the recordkeeping requirements of Rule 613(e)(8); (2) consistent with Appendix D, Central Repository Requirements, ensure the effective management and operation of the Central Repository; (3) consistent with Appendix D, Data Management, ensure the accuracy of the consolidation of the CAT Data¹³⁷ reported to the Central Repository; and (4) consistent with Appendix D, Upgrade Process and Development of New Functionality, design and implement appropriate policies and procedures governing the determination to develop new functionality for the CAT including, among other requirements, a mechanism by which changes can be suggested by Advisory Committee members, Participants, or the Commission.¹³⁸ Such policies and procedures also shall: (1) provide for the escalation of reviews of proposed technological changes and upgrades to the Operating Committee; and (2)

¹³⁵ Id. at Section 6.1(a).

¹³⁶ Id. at Section 6.1(d).

¹³⁷ “CAT Data” means data derived from Participant Data, Industry Member Data, SIP Data, and such other data as the Operating Committee may designate as “CAT Data” from time to time. Id. at Section 1.1.

¹³⁸ Id. at Section 6.1(d).

address the handling of surveillance, including coordinated, Rule 17d-2 under the Exchange Act or Regulatory Surveillance Agreement(s) (“RSA”) surveillance queries and requests for data.¹³⁹ Any policy, procedure or standard (and any material modification or amendment thereto) applicable primarily to the performance of the Plan Processor’s duties as the Plan Processor (excluding any policies, procedures or standards generally applicable to the Plan Processor’s operations and employees) will become effective only upon approval by the Operating Committee.¹⁴⁰ The Plan Processor also will, subject to the prior approval of the Operating Committee, establish appropriate procedures for escalation of matters to the Operating Committee.¹⁴¹ In addition to other policies, procedures and standards generally applicable to the Plan Processor’s employees and contractors, the Plan Processor will have hiring standards and will conduct and enforce background checks (e.g., fingerprint-based) for all of its employees and contractors to ensure the protection, safeguarding and security of the facilities, systems, networks, equipment and data of the CAT System, and will have an insider and external threat policy to detect, monitor and remedy cyber and other threats.¹⁴²

The Plan Processor will enter into appropriate Service Level Agreements (“SLAs”) governing the performance of the Central Repository, as generally described in Appendix D, Functionality of the CAT System, with the prior approval of the Operating Committee.¹⁴³ The Plan Processor in conjunction with the Operating Committee will regularly review and, as

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Id.

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Id. at Section 6.1(e).

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Id. at Section 6.1(f).

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Id. at Section 6.1(g).

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Id. at Section 6.1(h).

necessary, update the SLAs, in accordance with the terms of the SLAs.¹⁴⁴ As further contemplated in Appendix C, System Service Level Agreements (SLAs), and in Appendix D, System SLAs, the Plan Processor may enter into appropriate service level agreements with third parties applicable to the Plan Processor’s functions related to the CAT System (“Other SLAs”), with the prior approval of the Operating Committee.¹⁴⁵ The CCO and/or the Independent Auditor will, in conjunction with the Plan Processor, and as necessary the Operating Committee, regularly review and, as necessary, update the Other SLAs, in accordance with the terms of the applicable Other SLA.¹⁴⁶ In addition, the Plan Processor: (1) will, on an ongoing basis and consistent with any applicable policies and procedures, evaluate and implement potential system changes and upgrades to maintain and improve the normal day-to-day operating function of the CAT System;¹⁴⁷ (2) in consultation with the Operating Committee, will, on an as needed basis and consistent with any applicable operational and escalation policies and procedures, implement such material system changes and upgrades as may be required to ensure effective functioning of the CAT System;¹⁴⁸ and (3) in consultation with the Operating Committee, will, on an as needed basis, implement system changes and upgrades to the CAT System to ensure compliance with applicable laws, regulations or rules (including those promulgated by the SEC or any Participant).¹⁴⁹ Furthermore, the Plan Processor will develop and, with the prior approval of the

¹⁴⁴ Id.

¹⁴⁵ Id.

¹⁴⁶ Id.

¹⁴⁷ Id. at Section 6.1(i).

¹⁴⁸ Id. at Section 6.1(j).

¹⁴⁹ Id. at Section 6.1(k).

Operating Committee, implement a securities trading policy, as well as necessary procedures, control structures and tools to enforce this policy.¹⁵⁰

In addition, the Plan Processor will provide the Operating Committee regular reports on the CAT System's operation and maintenance.¹⁵¹ Furthermore, upon request of the Operating Committee or any Subcommittee, the Plan Processor will attend any meetings of the Operating Committee or such Subcommittee.¹⁵²

The Plan Processor may appoint such officers of the Plan Processor as it deems necessary and appropriate to perform its functions under the Plan and Rule 613.¹⁵³ The Plan Processor, however, will be required to appoint, at a minimum, the CCO, the CISO, and the Independent Auditor.¹⁵⁴ The Operating Committee, by Supermajority Vote, will approve any appointment or removal of the CCO, CISO, or the Independent Auditor.¹⁵⁵

In addition to a CCO, the Plan Processor will designate at least one other employee (in addition to the person then serving as CCO), which employee the Operating Committee has previously approved, to serve temporarily as the CCO if the employee then serving as the CCO becomes unavailable or unable to serve in such capacity (including by reason of injury or illness).¹⁵⁶ Any person designated to serve as the CCO (including to serve temporarily) will be appropriately qualified to serve in such capacity based on the duties and responsibilities assigned

¹⁵⁰ Id. at Section 6.1(l).

¹⁵¹ Id. at Section 6.1(o).

¹⁵² Id. at Section 6.1(p).

¹⁵³ Id. at Section 6.1(b).

¹⁵⁴ Id.

¹⁵⁵ Id.

¹⁵⁶ Id.

to the CCO and will dedicate such person's entire working time to such service (or temporary service) except for any time required to attend to any incidental administrative matters related to such person's employment with the Plan Processor that do not detract in any material respect from such person's service as the CCO.¹⁵⁷ Article VI sets forth various responsibilities of the CCO. With respect to all of his or her duties and responsibilities in such capacity (including those as set forth in the Plan), the CCO will be directly responsible and will directly report to the Operating Committee, notwithstanding that she or he is employed by the Plan Processor.¹⁵⁸ The Plan Processor, subject to the oversight of the Operating Committee, will ensure that the CCO has appropriate resources to fulfill his or her obligations under the Plan and Rule 613.¹⁵⁹ The compensation (including base salary and bonus) of the CCO will be payable by the Plan Processor, but be subject to review and approval by the Operating Committee.¹⁶⁰ The Operating Committee will render the CCO's annual performance review.¹⁶¹

In addition to a CISO, the Plan Processor will designate at least one other employee (in addition to the person then serving as CISO), which employee the Operating Committee has previously approved, to serve temporarily as the CISO if the employee then serving as the CISO becomes unavailable or unable to serve in such capacity (including by reason of injury or illness).¹⁶² Any person designated to serve as the CISO (including to serve temporarily) will be appropriately qualified to serve in such capacity based on the duties and responsibilities assigned

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Id.

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Id. at Section 6.2(a)(iii).

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Id. at Section 6.2(a)(ii).

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Id. at Section 6.2(a)(iv).

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Id. at Section 6.2(b)(i).

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Id.

to the CISO under the Plan and will dedicate such person's entire working time to such service (or temporary service) except for any time required to attend to any incidental administrative matters related to such person's employment with the Plan Processor that do not detract in any material respect from such person's service as the CISO.¹⁶³

The Plan Processor, subject to the oversight of the Operating Committee, will ensure that the CISO has appropriate resources to fulfill the obligations of the CISO set forth in Rule 613 and in the Plan, including providing appropriate responses to questions posed by the Participants and the SEC.¹⁶⁴ In performing such obligations, the CISO will be directly responsible and directly report to the Operating Committee, notwithstanding that he or she is employed by the Plan Processor.¹⁶⁵ The compensation (including base salary and bonus) of the CISO will be payable by the Plan Processor, but be subject to review and approval by the Operating Committee, and the Operating Committee will render the CISO's annual performance review.¹⁶⁶ Consistent with Appendices C and D, the CISO will be responsible for creating and enforcing appropriate policies, procedures, standards, control structures and real-time tools to monitor and address data security issues for the Plan Processor and the Central Repository, as described in the Plan.¹⁶⁷ At regular intervals, to the extent that such information is available to the Company, the CISO will report to the Operating Committee the activities of the Financial Services Information

¹⁶³ Id.

¹⁶⁴ Id. at Section 6.2(b)(ii).

¹⁶⁵ Id. at Section 6.2(b)(iii).

¹⁶⁶ Id. at Section 6.2(b)(iv).

¹⁶⁷ Id. at Section 6.2(b)(v).

Sharing and Analysis Center (“FS-ISAC”) or comparable bodies to the extent that the Company has joined FS-ISAC or other comparable body.¹⁶⁸

The Plan Processor will afford to the Participants and the Commission such access to the Representatives of the Plan Processor as any Participant or the Commission may reasonably request solely for the purpose of performing such Person’s regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations or any contractual obligations.¹⁶⁹ The Plan Processor will direct such Representatives to reasonably cooperate with any inquiry, investigation, or proceeding conducted by or on behalf of any Participant or the Commission related to such purpose.¹⁷⁰

The Operating Committee will review the Plan Processor’s performance under the Plan at least once each year, or more often than once each year upon the request of two or more Participants that are not Affiliated Participants.¹⁷¹ The Operating Committee will notify the SEC of any determination made by the Operating Committee concerning the continuing engagement of the Plan Processor as a result of the Operating Committee’s review of the Plan Processor and will provide the SEC with a copy of any reports that may be prepared in connection therewith.¹⁷²

The Operating Committee, by Supermajority Vote, may remove the Plan Processor from such position at any time.¹⁷³ However, the Operating Committee, by Majority Vote, may remove the Plan Processor from such position at any time if it determines that the Plan Processor

¹⁶⁸ Id. at Section 6.2(b)(vi).

¹⁶⁹ Id. at Section 6.1(u).

¹⁷⁰ Id.

¹⁷¹ Id. at Section 6.1(n).

¹⁷² Id.

¹⁷³ Id. at Section 6.1(q).

has failed to perform its functions in a reasonably acceptable manner in accordance with the provisions of the Plan or that the Plan Processor's expenses have become excessive and are not justified.¹⁷⁴ In making such a determination, the Operating Committee will consider, among other factors: (1) the reasonableness of the Plan Processor's response to requests from Participants or the Company for technological changes or enhancements; (2) results of any assessments performed pursuant to Section 6.6; (3) the timeliness of preventative and corrective information technology system maintenance for reliable and secure operations; (4) compliance with requirements of Appendix D; and (5) such other factors related to experience, technological capability, quality and reliability of service, costs, back-up facilities, failure to meet service level agreement(s) and regulatory considerations as the Operating Committee may determine to be appropriate.¹⁷⁵

In addition, the Plan Processor may resign upon two year's (or such other shorter period as may be determined by the Operating Committee by Supermajority Vote) prior written notice.¹⁷⁶ The Operating Committee will fill any vacancy in the Plan Processor position by Supermajority Vote, and will establish a Plan Processor Selection Subcommittee to evaluate and review Bids and make a recommendation to the Operating Committee with respect to the selection of the successor Plan Processor.¹⁷⁷

¹⁷⁴ Id. at Section 6.1(r).

¹⁷⁵ Id.

¹⁷⁶ Id. at Section 6.1(s).

¹⁷⁷ Id. at Section 6.1(t).

b. Central Repository

The Central Repository, under the oversight of the Plan Processor, and consistent with Appendix D, Central Repository Requirements, will receive, consolidate, and retain all CAT Data.¹⁷⁸ The Central Repository will collect (from a Securities Information Processor (“SIP”) or pursuant to an NMS plan) and retain on a current and continuing basis, in a format compatible with the Participant Data and Industry Member Data, all data, including the following: (1) information, including the size and quote condition, on quotes, including the National Best Bid and National Best Offer for each NMS Security;¹⁷⁹ (2) Last Sale Reports and transaction reports reported pursuant to an effective transaction reporting plan filed with the SEC pursuant to, and meeting the requirements of, Rules 601 and 608;¹⁸⁰ (3) trading halts, Limit Up-Limit Down price bands and LULD indicators;¹⁸¹ and (4) summary data or reports described in the specifications for each of the SIPs and disseminated by the respective SIP.¹⁸²

Consistent with Appendix D, Data Retention Requirements, the Central Repository will retain the information collected pursuant to paragraphs (c)(7) and (e)(7) of Rule 613 in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention by the Plan Processor for a period of not less than six years. Such data, when available to the Participants’ regulatory Staff and the SEC, will be

¹⁷⁸ Id. at Section 6.5(a)(i).

¹⁷⁹ Id. at Section 6.5(a)(ii)(A).

¹⁸⁰ Id. at Section 6.5(a)(ii)(B).

¹⁸¹ Id. at Section 6.5(a)(ii)(C).

¹⁸² Id. at Section 6.5(a)(ii)(D).

linked.¹⁸³ In addition, the Plan Processor will implement and comply with the records retention policy contemplated by Section 6.1(d)(i).¹⁸⁴

Consistent with Appendix D, Data Access, the Plan Processor will provide Participants and the SEC access to the Central Repository (including all systems operated by the Central Repository), and access to and use of the CAT Data stored in the Central Repository, solely for the purpose of performing their respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules and regulations or any contractual obligations.¹⁸⁵ The Plan Processor will create and maintain a method of access to the CAT Data stored in the Central Repository that includes the ability to run searches and generate reports.¹⁸⁶ The method in which the CAT Data is stored in the Central Repository will allow the ability to return results of queries that are complex in nature, including market reconstructions and the status of order books at varying time intervals.¹⁸⁷ The Plan Processor will, at least annually and at such earlier time promptly following a request by the Operating Committee, certify to the Operating Committee that only the Participants and the SEC have access to the Central Repository (other than access provided to any Industry Member for the purpose of correcting CAT Data previously reported to the Central Repository by such Industry Member).¹⁸⁸

¹⁸³ Id. at Section 6.5(b)(i).

¹⁸⁴ Id. at Section 6.5(b)(ii).

¹⁸⁵ Id. at Section 6.5(c)(i).

¹⁸⁶ Id. at Section 6.5(c)(ii).

¹⁸⁷ Id. at Section 6.5(c)(ii).

¹⁸⁸ Id. at Section 6.5(c)(iii); see also id. at Appendix C, The Security and Confidentiality of Information Reported to the Central Repository, and Appendix D, Data Security, describe the security and confidentiality of the CAT Data, including how access to the Central Repository is controlled.

c. Data Recording and Reporting by Participants

The Plan also sets forth the requirements regarding the data recording and reporting by Participants.¹⁸⁹ Each Participant will record and electronically report to the Central Repository the following details for each order and each Reportable Event,¹⁹⁰ as applicable (“Participant Data;” also referred to as “Recorded Industry Member Data”, as discussed in the next Section):

for original receipt or origination of an order: (1) Firm Designated ID(s) (FDIs) for each customer;¹⁹¹ (2) CAT-Order-ID;¹⁹² (3) SRO-Assigned Market Participant Identifier of the Industry Member receiving or originating the order;¹⁹³ (4) date of order receipt or origination;¹⁹⁴ (5) time of order receipt or origination (using time stamps pursuant to Section 6.8);¹⁹⁵ and (6) the Material Terms of the Order.¹⁹⁶

for the routing of an order: (1) CAT-Order-ID;¹⁹⁷ (2) date on which the order is routed;¹⁹⁸ (3) time at which the order is routed (using time stamps pursuant to

¹⁸⁹ See CAT NMS Plan, supra note 5, at Section 6.3. Participants may, but are not required to, coordinate compliance with the recording and reporting efforts through the use of regulatory services agreements and/or agreements adopted pursuant to Rule 17d-2 under the Exchange Act.

¹⁹⁰ See CAT NMS Plan, supra note 5, at Section 6.5(d). The CAT NMS Plan defines “Reportable Event” as “includ[ing], but . . . not limited to, the original receipt or origination, modification, cancellation, routing, execution (in whole or in part) and allocation of an order, and receipt of a routed order.” Id. at Section 1.1.

¹⁹¹ Id. at Section 6.3(d)(i)(A).

¹⁹² Id. at Section 6.3(d)(i)(B).

¹⁹³ Id. at Section 6.3(d)(i)(C).

¹⁹⁴ Id. at Section 6.3(d)(i)(D).

¹⁹⁵ Id. at Section 6.3(d)(i)(E).

¹⁹⁶ Id. at Section 6.3(d)(i)(F). For a discussion of the Material Terms of the Order required by Rule 613, see Adopting Release, supra note 14, at 45750–52. The Commission notes that the Participants include in the Plan a requirement for the reporting of the OTC Equity Security symbol as one of the “Material Terms of the Order.” See CAT NMS Plan, supra note 5, at Section 1.1.

¹⁹⁷ See CAT NMS Plan, supra note 5, at Section 6.3(d)(ii)(A).

¹⁹⁸ Id. at Section 6.3(d)(ii)(B).

Section 6.8);¹⁹⁹ (4) SRO-Assigned Market Participant Identifier of the Industry Member or Participant routing the order;²⁰⁰ (5) SRO-Assigned Market Participant Identifier of the Industry Member or Participant to which the order is being routed;²⁰¹ (6) if routed internally at the Industry Member, the identity and nature of the department or desk to which the order is routed;²⁰² and (7) the Material Terms of the Order.²⁰³

for the receipt of an order that has been routed, the following information: (1) CAT-Order-ID;²⁰⁴ (2) date on which the order is received;²⁰⁵ (3) time at which the order is received (using time stamps pursuant to Section 6.8);²⁰⁶ (4) SRO-Assigned Market Participant Identifier of the Industry Member or Participant receiving the order;²⁰⁷ (5) SRO-Assigned Market Participant Identifier of the Industry Member or Participant routing the order;²⁰⁸ and (6) the Material Terms of the Order.²⁰⁹

if the order is modified or cancelled: (1) CAT-Order-ID;²¹⁰ (2) date the modification or cancellation is received or originated;²¹¹ (3) time at which the modification or cancellation is received or originated (using time stamps pursuant to Section 6.8);²¹² (4) price and remaining size of the order, if modified;²¹³ (5) other changes in Material Terms, if modified;²¹⁴ and (6) whether the modification

199 Id. at Section 6.3(d)(ii)(C).

200 Id. at Section 6.3(d)(ii)(D).

201 Id. at Section 6.3(d)(ii)(E).

202 Id. at Section 6.3(d)(ii)(F).

203 Id. at Section 6.3(d)(ii)(G).

204 Id. at Section 6.3(d)(iii)(A).

205 Id. at Section 6.3(d)(iii)(B).

206 Id. at Section 6.3(d)(iii)(C).

207 Id. at Section 6.3(d)(iii)(D).

208 Id. at Section 6.3(d)(iii)(E).

209 Id. at Section 6.3(d)(iii)(F).

210 Id. at Section 6.3(d)(iv)(A).

211 Id. at Section 6.3(d)(iv)(B).

212 Id. at Section 6.3(d)(iv)(C).

213 Id. at Section 6.3(d)(iv)(D).

214 Id. at Section 6.3(d)(iv)(E).

or cancellation instruction was given by the Customer, or was initiated by the Industry Member or Participant.²¹⁵

if the order is executed, in whole or in part: (1) CAT-Order-ID;²¹⁶ (2) date of execution;²¹⁷ (3) time of execution (using time stamps pursuant to Section 6.8);²¹⁸ (4) execution capacity (principal, agency or riskless principal);²¹⁹ (5) execution price and size;²²⁰ (6) the SRO-Assigned Market Participant Identifier of the Participant or Industry Member executing the order;²²¹ (7) whether the execution was reported pursuant to an effective transaction reporting plan or the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information;²²² and (8) other information or additional events as may otherwise be prescribed in Appendix D, Reporting and Linkage Requirements.²²³

As contemplated in Appendix D, Data Types and Sources, each Participant will report Participant Data to the Central Repository for consolidation and storage in a format specified by the Plan Processor, approved by the Operating Committee and compliant with Rule 613.²²⁴ As further described in Appendix D, Reporting and Linkage Requirements, each Participant is required to record the Participant Data contemporaneously with the Reportable Event.²²⁵ In addition, each Participant must report the Participant Data to the Central Repository by 8:00 a.m. Eastern Time (“ET”) on the Trading Day following the day that the Participant recorded the

²¹⁵ Id. at Section 6.3(d)(iv)(F).

²¹⁶ Id. at Section 6.3(d)(v)(A).

²¹⁷ Id. at Section 6.3(d)(v)(B).

²¹⁸ Id. at Section 6.3(d)(v)(C).

²¹⁹ Id. at Section 6.3(d)(v)(D).

²²⁰ Id. at Section 6.3(d)(v)(E).

²²¹ Id. at Section 6.3(d)(v)(F).

²²² Id. at Section 6.3(d)(v)(G).

²²³ Id. at Section 6.3(d)(vi).

²²⁴ Id. at Section 6.3(a); Appendix D, Section 2.1.

²²⁵ Id. at Section 6.3(b)(i); Appendix D, Section 3.

Participant Data.²²⁶ Participants may voluntarily report the Participant Data prior to the 8:00 a.m. ET deadline.²²⁷

Each Participant that is a national securities exchange is required to comply with the above recording and reporting requirements for each NMS Security registered or listed for trading on such exchange or admitted to unlisted trading privileges on such exchange.²²⁸ Each Participant that is a national securities association is required to comply with the above recording and reporting requirements for each Eligible Security for which transaction reports are required to be submitted to the association.²²⁹

d. Data Reporting and Recording by Industry Members

The Plan also sets forth the data reporting and recording requirements for Industry Members. Specifically, subject to Section 6.4(c), and Section 6.4(d)(iii) with respect to Options Market Makers, and consistent with Appendix D, Reporting and Linkage Requirements, each Participant, through its Compliance Rule, will require its Industry Members to record and electronically report to the Central Repository for each order and each Reportable Event the information referred to in Section 6.3(d), as applicable (“Recorded Industry Member Data”)—that is, Participant Data discussed above.²³⁰ In addition, subject to Section 6.4(c), and Section 6.4(d)(iii) with respect to Options Market Makers, and consistent with Appendix D, Reporting and Linkage Requirements, each Participant, through its Compliance Rule, will require its

²²⁶ Id. at Section 6.3(b)(ii).

²²⁷ Id. at Section 6.3(b)(ii).

²²⁸ Id. at Section 6.3(c)(i).

²²⁹ Id. at Section 6.3(c)(ii).

²³⁰ Id. at Section 6.4(d)(i).

Industry Members to record and report to the Central Repository the following (“Received Industry Member Data” and, collectively with the Recorded Industry Member Data, “Industry Member Data”): (1) if the order is executed, in whole or in part: (a) an Allocation Report;²³¹ (b) SRO-Assigned Market Participant Identifier of the clearing broker or prime broker, if applicable; and (c) CAT-Order-ID of any contra-side order(s); (2) if the trade is cancelled, a cancelled trade indicator; and (3) for original receipt or origination of an order, information of sufficient detail to identify the Customer.²³²

With respect to the reporting obligations of an Options Market Maker with regard to its quotes in Listed Options, Reportable Events required pursuant to Sections 6.3(d)(ii) and (iv) will be reported to the Central Repository by an Options Exchange in lieu of the reporting of such information by the Options Market Maker.²³³ Each Participant that is an Options Exchange will, through its Compliance Rule, require its Industry Members that are Options Market Makers to report to the Options Exchange the time at which a quote in a Listed Option is sent to the Options Exchange (and, if applicable, any subsequent quote modifications and/or cancellation time when such modification or cancellation is originated by the Options Market Maker).²³⁴ Such time information also will be reported to the Central Repository by the Options Exchange in lieu of reporting by the Options Market Maker.²³⁵

²³¹ Id. at Section 6.4(d)(ii).

²³² Id.

²³³ Id. at Section 6.4(d)(iii).

²³⁴ Id.

²³⁵ Id.

Each Participant will, through its Compliance Rule, require its Industry Members to record and report to the Central Repository other information or additional events as prescribed in Appendix D, Reporting and Linkage Requirements.²³⁶

As contemplated in Appendix D, Data Types and Sources, each Participant will require its Industry Members to report Industry Member Data to the Central Repository for consolidation and storage in a format(s) specified by the Plan Processor, approved by the Operating Committee and compliant with Rule 613.²³⁷ As further described in Appendix D, Reporting and Linkage Requirements, each Participant will require its Industry Members to record Recorded Industry Member Data contemporaneously with the applicable Reportable Event.²³⁸ In addition, consistent with Appendix D, Reporting and Linkage Requirements, each Participant will require its Industry Members to report: (1) Recorded Industry Member Data to the Central Repository by 8:00 a.m. ET on the Trading Day following the day the Industry Member records such Recorded Industry Member Data; and (2) Received Industry Member Data to the Central Repository by 8:00 a.m. ET on the Trading Day following the day the Industry Member receives such Received Industry Member Data.²³⁹ Each Participant will permit its Industry Members to voluntarily report Industry Member Data prior to the applicable 8:00 a.m. ET deadline.²⁴⁰

Each Participant that is a national securities exchange must require its Industry Members to report Industry Member Data for each NMS Security registered or listed for trading on such

²³⁶ Id. at Section 6.4(d)(v).

²³⁷ Id. at Section 6.4(e).

²³⁸ Id. at Section 6.4(b)(i).

²³⁹ Id. at Section 6.4(b)(ii).

²⁴⁰ Id.

exchange or admitted to unlisted trading privileges on such exchange.²⁴¹ Each Participant that is a national securities association must require its Industry Members to report Industry Member Data for each Eligible Security for which transaction reports are required to be submitted to the association.²⁴²

e. Written Assessment

As described in Article VI, the Participants are required to provide the Commission with a written assessment of the operation of the CAT that meets the requirements set forth in Rule 613, Appendix D, and the Plan at least every two years or more frequently in connection with any review of the Plan Processor’s performance under the Plan pursuant to Section 6.1(n).²⁴³ The CCO will oversee this assessment and will provide the Participants a reasonable time to review and comment upon the written assessment prior to its submission to the SEC.²⁴⁴ In no case will the written assessment be changed or amended in response to a comment from a Participant; rather any comment by a Participant will be provided to the SEC at the same time as the written assessment.²⁴⁵

f. Business Clock Synchronization and Timestamp

Section 6.8 of the Plan discusses the synchronization of Business Clocks²⁴⁶ and timestamps.

²⁴¹ Id. at Section 6.4(c)(i).

²⁴² Id. at Section 6.4(c)(ii).

²⁴³ See CAT NMS Plan, supra note 5, at Section 6.6(a)(i).

²⁴⁴ Id. at Section 6.6(a)(ii).

²⁴⁵ Id.

²⁴⁶ Id. at Section 1.1. The CAT NMS Plan defines a “Business Clock” to mean “a clock used to record the date and time of any Reportable Event required to be reported under SEC Rule 613.” Id.

Each Participant is required to synchronize its Business Clocks (other than such Business Clocks used solely for Manual Order Events) at a minimum to within 50 milliseconds of the time maintained by the National Institute of Standards and Technology (“NIST”), consistent with industry standards.²⁴⁷ In addition, each Participant must, through its Compliance Rule, require its Industry Members to: (1) synchronize their respective Business Clocks (other than such Business Clocks used solely for Manual Order Events) at a minimum to within 50 milliseconds of the time maintained by the NIST, and maintain such a synchronization; (2) certify periodically that their Business Clocks meet the requirements of the Compliance Rule; and (3) report to the Plan Processor and the Participant any violation of the Compliance Rule pursuant to the thresholds set by the Operating Committee.²⁴⁸ Furthermore, each Participant is required to synchronize its Business Clocks and, through its Compliance Rule, require its Industry Members to synchronize their Business Clocks used solely for Manual Order Events at a minimum to within one second of the time maintained by the NIST, consistent with industry standards, and maintain such synchronization.²⁴⁹ Each Participant will require its Industry Members to certify periodically (according to a schedule defined by the Operating Committee) that their Business

²⁴⁷ Id. at Section 6.8(a)(i). Participants and Industry Members reviewed their respective internal clock synchronization technology practices, and reviewed the results of The Financial Information Forum (“FIF”) Clock Offset and determined that a 50 millisecond clock offset tolerance was consistent with the current industry clock synchronization standard. See CAT NMS Plan, supra note 5, at Appendix C, Section A.3(c) and D.12(p); see also Financial Information Forum, FIF Clock Offset Survey Preliminary Report (February 17, 2015), available at <http://www.catnmsplan.com/industryfeedback/p602479.pdf> and <http://catnmsplan.com/web/groups/catnms/@catnms/documents/appsupportdocs/p602479.pdf> (“FIF Clock Offset Survey”).

²⁴⁸ See CAT NMS Plan, supra note 5, at Section 6.8(a)(ii).

²⁴⁹ Id. at Section 6.8(a)(iii).

Clocks used solely for Manual Order Events meet the requirements of the Compliance Rule.²⁵⁰ The Compliance Rule of a Participant shall require its Industry Members using Business Clocks solely for Manual Order Events to report to the Plan Processor any violation of the Compliance Rule pursuant to the thresholds set by the Operating Committee.²⁵¹ Pursuant to Section 6.8(c) of the CAT NMS Plan, the CCO, in conjunction with the Participants and other appropriate Industry Member advisory groups, annually must evaluate and make a recommendation to the Operating Committee as to whether the industry standard has evolved such that the clock synchronization standard should be tightened.²⁵²

Appendix C discusses mechanisms to ensure compliance with the 50 millisecond clock offset tolerance.²⁵³ The Participants anticipate that they and Industry Members will adopt policies and procedures to verify the required clock synchronization each trading day before the market opens, as well as periodically throughout the trading day.²⁵⁴ The Participants also anticipate that they and Industry Members will document their clock synchronization procedures and maintain a log recording the time of each clock synchronization performed, and the result of such synchronization, specifically identifying any synchronization revealing any clock offset between the Participant's or Industry Member's Business Clock and the time maintained by the NIST exceeding 50 milliseconds.²⁵⁵ The CAT NMS Plan states that once both large and small

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Id.

251

Id.

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Id. at Section 6.8(c).

253

See id. at Appendix C, Section A.3(c).

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See id.

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See id. It was noted that such a log would include results for a period of not less than five years ending on the then current date. Id.

broker-dealers begin reporting to the Central Repository, and as clock synchronization technology matures further, the Participants will assess, in accordance with Rule 613, tightening the CAT's clock synchronization standards to reflect changes in industry standards.²⁵⁶

Each Participant shall, and through its Compliance Rule require its Industry Members to, report information required by Rule 613 and the Plan to the Central Repository in milliseconds.²⁵⁷ To the extent that any Participant utilizes timestamps in increments finer than the minimum required by the Plan, the Participant is required to make reports to the Central Repository utilizing such finer increment when reporting CAT Data to the Central Repository so that all Reportable Events reported to the Central Repository could be adequately sequenced. Each Participant will, through its Compliance Rule: (1) require that, to the extent that its Industry Members utilize timestamps in increments finer than the minimum required in the Plan, such Industry Members will utilize such finer increment when reporting CAT Data to the Central Repository; and (2) provide that a pattern or practice of reporting events outside of the required clock synchronization time period without reasonable justification or exceptional circumstances may be considered a violation of SEC Rule 613 and the Plan.²⁵⁸ Notwithstanding the preceding sentences, each Participant and Industry Member will be permitted to record and report Manual Order Events to the Central Repository in increments up to and including one second, provided that Participants and Industry Members will be required to record and report the time when a Manual Order Event has been captured electronically in an order handling and execution system

²⁵⁶ See id. at Appendix C, Section D.12(p).

²⁵⁷ See id. at Section 6.8(b).

²⁵⁸ Id. at Section 6.8(b).

of such Participant or Industry Member (“Electronic Capture Time”) in milliseconds.²⁵⁹ In conjunction with Participants’ and other appropriate Industry Member advisory groups, the CCO will annually evaluate and make a recommendation to the Operating Committee as to whether industry standards have evolved such that the required synchronization should be shortened or the required timestamp should be in finer increments.²⁶⁰ The Operating Committee will make determinations regarding the need to revise the synchronization and timestamp requirements.²⁶¹

g. Technical Specifications

Section 6.9 of the Plan establishes the requirements involving the Plan Processor’s Technical Specifications. The Plan Processor will publish Technical Specifications that are at a minimum consistent with Appendices C and D, and updates thereto as needed, providing detailed instructions regarding the submission of CAT Data by Participants and Industry Members to the Plan Processor for entry into the Central Repository.²⁶² The Technical Specifications will be made available on a publicly available web site to be developed and maintained by the Plan Processor.²⁶³ The initial Technical Specifications and any Material Amendments thereto will require the approval of the Operating Committee by Supermajority Vote.²⁶⁴

The Technical Specifications will include a detailed description of the following: (1) the specifications for the layout of files and records submitted to the Central Repository; (2) the process for the release of new data format specification changes; (3) the process for industry

²⁵⁹ Id.

²⁶⁰ Id. at Section 6.8(c).

²⁶¹ Id. at Sections 6.8(a)(ii)(C), 6.8(a)(iii).

²⁶² Id. at Section 6.9(a).

²⁶³ Id.

²⁶⁴ Id.

testing for any changes to data format specifications; (4) the procedures for obtaining feedback about and submitting corrections to information submitted to the Central Repository; (5) each data element, including permitted values, in any type of report submitted to the Central Repository; (6) any error messages generated by the Plan Processor in the course of validating the data; (7) the process for file submissions (and re-submissions for corrected files); (8) the storage and access requirements for all files submitted; (9) metadata requirements for all files submitted to the CAT System; (10) any required secure network connectivity; (11) data security standards, which will, at a minimum: (a) satisfy all applicable regulations regarding database security, including provisions of Regulation Systems Compliance and Integrity under the Exchange Act (“Reg SCI”); (b) to the extent not otherwise provided for under the Plan (including Appendix C thereto), set forth such provisions as may be necessary or appropriate to comply with Rule 613(e)(4); and (c) comply with industry best practices; and (12) any other items reasonably deemed appropriate by the Plan Processor and approved by the Operating Committee.²⁶⁵

Amendments to the Technical Specifications may be made only in accordance with Section 6.9(c).²⁶⁶ The process for amending the Technical Specifications varies depending on whether the change is material. An amendment will be deemed “material” if it would require a Participant or an Industry Member to engage in significant changes to the coding necessary to submit information to the Central Repository pursuant to the Plan, or if it is required to safeguard the security or confidentiality of the CAT Data.²⁶⁷ Except for Material Amendments to the

²⁶⁵ Id. at Section 6.9(b).

²⁶⁶ Id. at Section 6.9(c).

²⁶⁷ Id.

Technical Specifications, the Plan Processor will have the sole discretion to amend and publish interpretations regarding the Technical Specifications; however, all non-Material Amendments made to the Technical Specifications and all published interpretations will be provided to the Operating Committee in writing at least ten days before being published.²⁶⁸ Such non-Material Amendments and published interpretations will be deemed approved ten days following provision to the Operating Committee unless two or more unaffiliated Participants call for a vote to be taken on the proposed amendment or interpretation.²⁶⁹ If an amendment or interpretation is called for a vote by two or more unaffiliated Participants, the proposed amendment must be approved by Majority Vote of the Operating Committee.²⁷⁰ Once a non-Material Amendment has been approved or deemed approved by the Operating Committee, the Plan Processor will be responsible for determining the specific changes to the Central Repository and providing technical documentation of those changes, including an implementation timeline.²⁷¹

Material Amendments to the Technical Specifications require approval of the Operating Committee by Supermajority Vote.²⁷² The Operating Committee, by Supermajority Vote, may amend the Technical Specifications on its own motion.²⁷³

h. Surveillance

Surveillance requirements are described in Section 6.10. Using the tools provided for in Appendix D, Functionality of the CAT System, each Participant will develop and implement a

²⁶⁸ Id. at Section 6.9(c)(i).

²⁶⁹ Id.

²⁷⁰ Id.

²⁷¹ Id.

²⁷² Id. at Section 6.9(c)(ii).

²⁷³ Id. at Section 6.9(c)(iii).

surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the Central Repository.²⁷⁴ Unless otherwise ordered by the SEC, within fourteen months after the Effective Date, each Participant must initially implement a new or enhanced surveillance system(s) as required by Rule 613 and Section 6.10(a) of the Plan.²⁷⁵ Participants may, but are not required to, coordinate surveillance efforts through the use of regulatory services agreements and agreements adopted pursuant to Rule 17d-2 under the Exchange Act.²⁷⁶

Consistent with Appendix D, Functionality of the CAT System, the Plan Processor will provide Participants and the SEC with access to all CAT Data stored in the Central Repository. Regulators will have access to processed CAT Data through two different methods: (1) an online targeted query tool; and (2) user-defined direct queries and bulk extracts.²⁷⁷ The online targeted query tool will provide authorized users with the ability to retrieve CAT Data via an online query screen that includes the ability to choose from a variety of pre-defined selection criteria.²⁷⁸ Targeted queries must include date(s) and/or time range(s), as well as one or more of a variety of fields.²⁷⁹ The user-defined direct queries and bulk extracts will provide authorized users with the ability to retrieve CAT Data via a query tool or language that allows users to query all available attributes and data sources.²⁸⁰

²⁷⁴ See CAT NMS Plan, supra note 5, at Section 6.10(a).

²⁷⁵ Id.

²⁷⁶ Id. at Section 6.10(b).

²⁷⁷ Id. at Section 6.10(c)(i).

²⁷⁸ Id. at Section 6.10(c)(i)(A).

²⁷⁹ Id.

²⁸⁰ Id. at Section 6.10(c)(i)(B).

Extraction of CAT Data will be consistent with all permission rights granted by the Plan Processor.²⁸¹ All CAT Data returned will be encrypted, and PII data²⁸² will be masked unless users have permission to view the PII contained in the CAT Data that has been requested.²⁸³

The Plan Processor will implement an automated mechanism to monitor direct query usage.²⁸⁴ Such monitoring will include automated alerts to notify the Plan Processor of potential issues with bottlenecks or excessively long queues for queries or CAT Data extractions.²⁸⁵ The Plan Processor will provide the Operating Committee or its designee(s) details as to how the monitoring will be accomplished and the metrics that will be used to trigger alerts.²⁸⁶

The Plan Processor will reasonably assist regulatory Staff (including those of Participants) with creating queries.²⁸⁷ Without limiting the manner in which regulatory Staff (including those of Participants) may submit queries, the Plan Processor will submit queries on behalf of regulatory Staff (including those of Participants) as reasonably requested.²⁸⁸ The Plan Processor will staff a CAT help desk, as described in Appendix D, CAT Help Desk, to provide technical

²⁸¹ Id. at Section 6.10(c)(ii).

²⁸² The proposed CAT NMS Plan defines PII as “personally identifiable information, including a social security number or tax identifier number or similar information.” Id. at Section 1.1.

²⁸³ Id. at Section 6.10(c)(ii).

²⁸⁴ Id. at Section 6.10(c)(iii) (providing that “[s]uch monitoring shall include automated alerts to notify the Plan Processor of potential issues with bottlenecks or excessively long queues for queries or CAT Data extractions. The Plan Processor shall provide the Operating Committee or its designee(s) details as to how the monitoring will be accomplished and the metrics that will be used to trigger alerts”).

²⁸⁵ Id.

²⁸⁶ Id.

²⁸⁷ Id. at 6.10(c)(iv).

²⁸⁸ Id. at Section 6.10(c)(v).

expertise to assist regulatory Staff (including those of Participants) with questions about the content and structure of the CAT Data.²⁸⁹

i. Information Security Program

As set forth in Section 6.12, the Plan Processor is required to develop and maintain a comprehensive information security program for the Central Repository that contains, at a minimum, the specific requirements detailed in Appendix D, Data Security. The information security program must be approved and reviewed at least annually by the Operating Committee.²⁹⁰

6. Financial Matters

Articles VII and VIII of the Plan address certain financial matters related to the Company. In particular, the Plan states that, subject to certain special allocations provided for in Section 8.2, any net profit or net loss will be allocated among the Participants equally.²⁹¹ In addition, subject to Section 10.2, cash and property of the Company will not be distributed to the Participants unless the Operating Committee approves by Supermajority Vote a distribution after fully considering the reason that such distribution must or should be made to the Participants, including the circumstances contemplated under Section 8.3, Section 8.6, and Section 9.3.²⁹² To the extent a distribution is made, all Participants will participate equally in any such distribution except as otherwise provided in Section 10.2.²⁹³

²⁸⁹ Id. at Section 6.10(c)(vi).

²⁹⁰ Id. at Section 6.12.

²⁹¹ Id. at Section 8.1.

²⁹² Id. at Section 8.5(a).

²⁹³ Id.

Article XI addresses the funding of the Company. On an annual basis the Operating Committee will approve an operating budget for the Company.²⁹⁴ The budget will include the projected costs of the Company, including the costs of developing and operating the CAT System for the upcoming year, and the sources of all revenues to cover such costs, as well as the funding of any reserve that the Operating Committee reasonably deems appropriate for prudent operation of the Company.²⁹⁵

Subject to certain funding principles set forth in Article XI, the Operating Committee will have discretion to establish funding for the Company, including: (1) establishing fees that the Participants will pay; and (2) establishing fees for Industry Members that will be implemented by Participants.²⁹⁶ In establishing the funding of the Company, the Operating Committee will seek to: (1) create transparent, predictable revenue streams for the Company that are aligned with the anticipated costs to build, operate and administer the CAT and the other costs of the Company; (2) establish an allocation of the Company's related costs among Participants and Industry Members that is consistent with the Exchange Act, taking into account the timeline for implementation of the CAT and distinctions in the securities trading operations of Participants and Industry Members and their relative impact upon Company resources and operations; (3) establish a tiered fee structure in which the fees charged to: (a) CAT Reporters that are Execution Venues, including Alternative Trading Systems ("ATs"), are based upon the level of market share, (b) Industry Members' non-ATS activities are based upon message traffic, and (c) the CAT Reporters with the most CAT-related activity (measured by market share and/or

²⁹⁴ Id. at Section 11.1(a).

²⁹⁵ Id.

²⁹⁶ Id. at Section 11.1(b).

message traffic, as applicable) are generally comparable (where, for these comparability purposes, the tiered fee structure takes into consideration affiliations between or among CAT Reporters, whether Execution Venues and/or Industry Members); (4) provide for ease of billing and other administrative functions; (5) avoid any disincentives such as placing an inappropriate burden on competition and a reduction in market quality; and (6) build financial stability to support the Company as a going concern.²⁹⁷ The Participants will file with the SEC under Section 19(b) of the Exchange Act any such fees on Industry Members that the Operating Committee approves, and such fees will be labeled as “Consolidated Audit Trail Funding Fees.”²⁹⁸

To fund the development and implementation of the CAT, the Company will time the imposition and collection of all fees on Participants and Industry Members in a manner reasonably related to the timing when the Company expects to incur such development and implementation costs.²⁹⁹ In determining fees for Participants and Industry Members, the Operating Committee shall take into account fees, costs and expenses (including legal and consulting fees and expenses) incurred by the Participants on behalf of the Company prior to the Effective Date in connection with the creation and implementation of the CAT, and such fees, costs and expenses shall be fairly and reasonably shared among the Participants and Industry Members.³⁰⁰ Consistent with Article XI, the Operating Committee will adopt policies, procedures, and practices regarding the budget and budgeting process, assignment of tiers,

²⁹⁷ Id. at Section 11.2.

²⁹⁸ Id. at Section 11.1(b).

²⁹⁹ Id. at Section 11.1(c).

³⁰⁰ Id.

resolution of disputes, billing and collection of fees, and other related matters.³⁰¹ As a part of its regular review of fees for the CAT, the Operating Committee will have the right to change the tier assigned to any particular Person pursuant to this Article XI.³⁰² Any such changes will be effective upon reasonable notice to such Person.³⁰³

The Operating Committee will establish fixed fees to be payable by Execution Venues as follows. Each Execution Venue that executes transactions, or, in the case of a national securities association, has trades reported by its members to its trade reporting facility or facilities for reporting transactions effected otherwise than on an exchange, in NMS Stocks or OTC Equity Securities will pay a fixed fee depending on the market share of that Execution Venue in NMS Stocks and OTC Equity Securities.³⁰⁴ The Operating Committee will establish at least two and no more than five tiers of fixed fees, based on an Execution Venue's NMS Stocks and OTC Equity Securities market share.³⁰⁵ For these purposes, market share will be calculated by share volume.³⁰⁶ In addition, each Execution Venue that executes transactions in Listed Options will pay a fixed fee depending on the Listed Options market share of that Execution Venue.³⁰⁷ The Operating Committee will establish at least two and no more than five tiers of fixed fees, based

³⁰¹ Id. at Section 11.1(d).

³⁰² The Commission notes that Section 11.1(b) of the CAT NMS Plan states that the Participants would file fees for Industry Members approved by the Operating Committee with the Commission. The Operating Committee may only change the tier to which a Person is assigned in accordance with a fee schedule filed with the Commission.

³⁰³ See CAT NMS Plan, supra note 5, at Section 11.1(d).

³⁰⁴ Id. at Section 11.3(a)(i).

³⁰⁵ Id.

³⁰⁶ Id.

³⁰⁷ Id. at Section 11.3(a)(ii).

on an Execution Venue's Listed Options market share, with market share calculated by contract volume.³⁰⁸ Changes to the number of tiers after approval of the Plan would require a Supermajority Vote of the Operating Committee and Commission approval under Section 19(b) of the Exchange Act, as would the establishment of the initial fee schedule and any changes to the fee schedule within the tier structure.³⁰⁹

The Operating Committee also will establish fixed fees payable by Industry Members, based on the message traffic generated by such Industry Member.³¹⁰ The Operating Committee will establish at least five and no more than nine tiers of fixed fees, based on message traffic.³¹¹ For the avoidance of doubt, the fixed fees payable by Industry Members pursuant to this paragraph will, in addition to any other applicable message traffic, include message traffic generated by: (1) an ATS that does not execute orders that is sponsored by such Industry Member; and (2) routing orders to and from any ATS system sponsored by such Industry Member.³¹²

Furthermore, the Operating Committee may establish any other fees ancillary to the operation of the CAT that it reasonably determines appropriate, including: fees for the late or

³⁰⁸ Id.

³⁰⁹ The Commission notes that the Participants could choose to submit the proposed fee schedule to the Commission as individual SROs pursuant to Rule 19b-4 or jointly as Participants to an NMS plan pursuant to Rule 608 of Regulation NMS. Because the proposed fee schedule would establish fees, whether the Participants individually file it pursuant to Section 19(b)(3)(A)(ii) of the Act, or jointly file it pursuant to Rule 608(b)(3)(i) of Regulation NMS, the proposed fee schedule could take effect upon filing with the Commission. See 15 U.S.C. 78s(b)(3)(A)(ii); 17 CFR 242.608(b)(3)(i); see also Section IV.F, infra.

³¹⁰ See CAT NMS Plan, supra note 5, at Section 11.3(b).

³¹¹ Id.

³¹² Id.

inaccurate reporting of information to the CAT; fees for correcting submitted information; and fees based on access and use of the CAT for regulatory and oversight purposes (and not including any reporting obligations).³¹³

The Company will make publicly available a schedule of effective fees and charges adopted pursuant to the Plan as in effect from time to time.³¹⁴ Such schedule will be developed after the Plan Processor is selected.³¹⁵ The Operating Committee will review the fee schedule on at least an annual basis and will make any changes to such fee schedule that it deems appropriate.³¹⁶ The Operating Committee is authorized to review the fee schedule on a more regular basis, but will not make any changes on more than a semi-annual basis unless, pursuant to a Supermajority Vote, the Operating Committee concludes that such change is necessary for the adequate funding of the Company.³¹⁷

The Operating Committee will establish a system for the collection of fees authorized under the Plan.³¹⁸ The Operating Committee may include such collection responsibility as a function of the Plan Processor or another administrator.³¹⁹ Alternatively, the Operating

³¹³ As it relates to fees that the Operating Committee may impose for access and use of the CAT for regulatory and oversight purposes, the Commission interprets the provisions in the Plan relating to the collection of fees as applying only to Participants and Industry Members, and thus the Commission would not be subject to such fees. See Section IV.F, infra, for further discussion regarding the funding of the Company.

³¹⁴ See CAT NMS Plan, supra note 5, at Section 11.3(d).

³¹⁵ Id.

³¹⁶ Id.; see also supra note 309.

³¹⁷ Id.

³¹⁸ Id. at Section 11.4.

³¹⁹ Id.

Committee may use the facilities of a clearing agency registered under Section 17A of the Exchange Act to provide for the collection of such fees.³²⁰

Each Participant will require each Industry Member to pay all applicable fees authorized under Article XI within thirty days after receipt of an invoice or other notice indicating payment is due (unless a longer payment period is otherwise indicated).³²¹ If an Industry Member fails to pay any such fee when due, such Industry Member will pay interest on the outstanding balance from such due date until such fee is paid at a per annum rate equal to the lesser of: (1) the Prime Rate plus 300 basis points; or (2) the maximum rate permitted by applicable law.³²² Each Participant will pay all applicable fees authorized under Article XI as required by Section 3.7(b).³²³

Disputes with respect to fees the Company charges Participants pursuant to Article XI will be determined by the Operating Committee or a Subcommittee designated by the Operating Committee.³²⁴ Decisions by the Operating Committee on such matters shall be binding on Participants, without prejudice to the rights of any Participant to seek redress from the SEC pursuant to SEC Rule 608 or in any other appropriate forum.³²⁵ The Participants will adopt rules requiring that disputes with respect to fees charged to Industry Members pursuant to Article XI be determined by the Operating Committee or a Subcommittee.³²⁶ Decisions by the Operating

320 Id.

321 Id.

322 Id.

323 Id.

324 Id. at Section 11.5.

325 Id.

326 Id.

Committee or Subcommittee on such matters will be binding on Industry Members, without prejudice to the rights of any Industry Member to seek redress from the SEC pursuant to SEC Rule 608 or in any other appropriate forum.³²⁷

7. Amendments

Section 12.3 of the CAT NMS Plan, which governs amendments to the Plan, states that, except with respect to the addition of new Participants (Section 3.3), the transfer of Company Interest (Section 3.4), the termination of a Participant's participation in the Plan (Section 3.7), amendments to the Selection Plan (Section 5.3 [sic]) and special allocations (Section 8.2), any change to the Plan requires a written amendment authorized by the affirmative vote of not less than two-thirds of all of the Participants, or with respect to Section 3.8 by the affirmative vote of all the Participants.³²⁸ Such proposed amendment must be approved by the Commission pursuant to Rule 608 or otherwise becomes effective under Rule 608.³²⁹ Notwithstanding the foregoing, to the extent that the Commission grants exemptive relief applicable to any provision of the LLC Agreement, Participants and Industry Members will be entitled to comply with such provision pursuant to the terms of the exemptive relief so granted at the time such relief is granted irrespective of whether the LLC Agreement has been amended.³³⁰

8. Compliance Rule Applicable to Industry Members

Under Article III, each Participant agrees to comply with and enforce compliance by its Industry Members with the provisions of Rule 613 and the Plan, as applicable, to the Participant

³²⁷ Id.

³²⁸ Id. at Section 12.3.

³²⁹ Id.

³³⁰ Id.

and its Industry Members.³³¹ Accordingly, the Participants will endeavor to promulgate consistent rules (after taking into account circumstances and considerations that may impact Participants differently) requiring compliance by their respective Industry Members with the provisions of Rule 613 and the Plan.³³²

9. Plan Appendices

The Plan includes three appendices.³³³ Appendix A provides the Consolidated Audit Trail National Market System Plan Request for Proposal, as issued February 26, 2013 and subsequently updated. In addition, Rule 613(a)(1) requires that the Plan discuss twelve considerations that explain the choices made by the Participants to meet the requirements specified in Rule 613 for the CAT. In accordance with this requirement, the Participants have addressed each of the twelve considerations in Appendix C. Finally, Appendix D describes the technical requirements for the Plan Processor.

As mentioned, Appendix C discusses the various “considerations” regarding how the Participants propose to develop and implement the CAT required to be discussed by Rule 613.³³⁴ These considerations, include: (i) the reporting of data to the Central Repository, including the sources of the data and the manner in which the Central Repository will receive, extract, transform, load, and retain the data; (ii) the time and method by which the data in the Central Repository will be made available to regulators; (iii) the reliability and accuracy of the data reported to and maintained by the Central Repository throughout its lifecycle; (iv) the security

³³¹ Id. at Section 3.11.

³³² Id.

³³³ Appendix B is reserved for future use.

³³⁴ 17 CFR 242.613(a).

and confidentiality of the information reported to the Central Repository; (v) the flexibility and scalability of the systems used by the Central Repository to collect, consolidate and store CAT Data; (vi) the feasibility, benefits and costs of broker-dealers reporting certain information to the CAT in a timely manner; (vii) an analysis of expected benefits and estimated costs for creating, implementing, and maintaining the CAT pursuant to the proposed CAT NMS Plan; (viii) an analysis of the proposed CAT NMS Plan's impact on competition, efficiency, and capital formation; (ix) a plan to eliminate rules and systems that will be rendered duplicative by the CAT; (x) objective milestones to assess progress toward the implementation of the proposed CAT NMS Plan; (xi) the process by which Participants solicited views of members and other parties regarding creation, implementation, and maintenance of CAT and a summary of these views and how the Participants took them into account in preparing the CAT NMS Plan; and (xii) a discussion of reasonable alternative approaches that the Participants considered to create, implement, and maintain the CAT.³³⁵

The technical requirements discussed in Appendix D to the CAT NMS Plan, CAT NMS Plan Processor Requirements, include an outline of minimum functional and technical requirements established by the Participants of the CAT NMS Plan for the Plan Processor. Appendix D provides the Plan Processor with details and guidelines for compliance with the requirements contained in Article VI that are not expressly stated therein.

Appendix D also outlines technical architecture, capacity and data retention requirements for the Central Repository,³³⁶ as well as describes the types of data that would be reported to the

³³⁵ See CAT NMS Plan, supra note 5, at Appendix C, Sections A.1–6, B.7–8, C.9–10.

³³⁶ Id. at Appendix D, Sections 1.1, 1.3–1.4.

Central Repository and the sources of such information.³³⁷ The Appendix outlines specific requirements relating to reporting data, linking data, validating and processing data and timing for availability to regulators.³³⁸ Appendix D further discusses how regulators would be able to access and use the data.³³⁹ It also provides requirements related to data security, and specific requirements governing how Customer and Customer Account Information must be captured and stored, separate from transactional data.³⁴⁰ Appendix D outlines requirements for the Plan Processor's disaster recovery and business continuity plans.³⁴¹ Finally, Appendix D describes plans for technical, operational, and business support to CAT Reporters for all aspects of reporting, and describes how upgrades and new functionality would be incorporated.³⁴²

10. Reporting Procedures

The CAT NMS Plan requires CAT Reporters to comply with specific reporting procedures when reporting CAT Data to the Central Repository.³⁴³ Specifically, CAT Reporters must format CAT Data to comply with the format specifications approved by the Operating Committee.³⁴⁴ CAT Reporters must record CAT Data contemporaneously with the applicable

³³⁷ Id. at Appendix D, Section 2.1.

³³⁸ Id. at Appendix D, Sections 3, 6.1–6.2, 7.2.

³³⁹ Id. at Appendix D, Section 8.1.

³⁴⁰ Id. at Appendix D, Sections 4.1, 9.1.

³⁴¹ Id. at Appendix D, Sections 5.3–5.4.

³⁴² Id. at Appendix D, Sections 10, 11.

³⁴³ Id. at Sections 6.3–6.4; Appendix D, at Section 2.1.

³⁴⁴ Id. at Sections 6.3(a), 6.4(a). The CAT NMS Plan also requires that the Operating Committee-approved format must be a format specified by the Plan Processor and Rule 613 compliant.

Reportable Event³⁴⁵ and report such data to the Central Repository by 8:00 a.m. ET on the next Trading Day.³⁴⁶ The obligation to report CAT Data applies to “each NMS Security registered or listed for trading on [a national securities] exchange or admitted to unlisted trading privileges on such exchange,” and “each Eligible Security for which transaction reports are required to be submitted to such [national securities] association.”³⁴⁷ Further, the Participants are required to adopt Compliance Rules³⁴⁸ that require Industry Members, subject to their SRO jurisdiction, to report CAT Data.³⁴⁹

The CAT NMS Plan requires specific data elements of CAT Data that must be recorded and reported to the Central Repository upon: (i) “original receipt or origination of an order,”³⁵⁰

³⁴⁵ Id. at Sections 6.3(b)(i), 6.4(b)(i).

³⁴⁶ Id. at Sections 6.3(b)(ii); 6.4(b)(ii); Appendix C, Section A.1(a)(ii). Participants may voluntarily report CAT Data prior to the 8:00 a.m. ET deadline. Id. The CAT NMS Plan defines “Trading Day” as the date “as is determined by the Operating Committee.” The CAT NMS Plan also provides that “the Operating Committee may establish different Trading Days for NMS Stocks (as defined in SEC Rule 600(b)(47), Listed Options, OTC Equity Securities, and any other securities that are included as Eligible Securities from time to time.”) Id. at Section 1.1.

³⁴⁷ See CAT NMS Plan, supra note 5, at Sections 6.3(c)(i)–(ii), 6.4(c)(i)–(ii).

³⁴⁸ The CAT NMS Plan defines the “Compliance Rule” to mean “with respect to a Participant, the rules promulgated by such Participant as contemplated by Section 3.11.” Id. at Section 1.1. Section 3.11 of the CAT NMS Plan provides that “each Participant shall comply with and enforce compliance, as required by SEC Rule 608(c), by its Industry Members with the provisions of SEC Rule 613 and of [the LLC Agreement], as applicable, to the Participant and its Industry Members. The Participants shall endeavor to promulgate consistent rules (after taking into account circumstances and considerations that may impact Participants differently) requiring compliance by their respective Industry Members with the provisions of SEC Rule 613 and [the LLC Agreement].” Id. at Section 3.11.

³⁴⁹ See id. at Section 6.4(c)(i)–(ii).

³⁵⁰ For “original receipt or origination of an order,” the CAT NMS Plan specifies the following data elements: (i) Firm Designated ID(s) for each Customer; (ii) CAT-Order-ID; (iii) SRO-Assigned Market Participant Identifier of the Industry Member receiving or

(ii) “routing of an order,”³⁵¹ and (iii) “receipt of an order that has been routed.”³⁵² Additionally, the CAT NMS Plan requires that a CAT Reporter must record and report data related to an “order [that] is modified or cancelled,”³⁵³ and an “order [that] is executed, in whole or in part,”³⁵⁴ as well as “other information or additional events as may be prescribed in Appendix D,

originating the order; (iv) date of order receipt or origination; (v) time of order receipt or origination (using timestamps pursuant to Section 6.8 of the CAT NMS Plan); and (vi) Material Terms of the Order. Id. at Section 6.3(d)(i).

351 For “routing of an order,” the CAT NMS Plan specifies the following data elements: (i) CAT-Order-ID; (ii) date on which the order is routed; (iii) time at which the order is routed (using timestamps pursuant to Section 6.8 of the CAT NMS Plan); (iv) SRO-Assigned Market Participant Identifier of the Industry Member or Participant routing the order; (v) SRO-Assigned Market Participant Identifier of the Industry Member or Participant to which the order is being routed; (vi) if routed internally at the Industry Member, the identity and nature of the department or desk to which the order is routed; and (vii) Material Terms of the Order. Id. at Section 6.3(d)(ii).

352 For “receipt of an order that has been routed,” the CAT NMS Plan specifies the following data elements: (i) CAT-Order-ID; (ii) date on which the order is received; (iii) time at which the order is received (using timestamps pursuant to Section 6.8); (iv) SRO-Assigned Market Participant Identifier of the Industry Member or Participant receiving the order; (v) SRO-Assigned Market Participant Identifier of the Industry Member or Participant routing the order; and (vi) Material Terms of the Order. Id. at Section 6.3(d)(iii).

353 For an “order [that] is modified or cancelled,” the CAT NMS Plan specifies the following data elements: (i) CAT-Order-ID; (ii) date the modification or cancellation is received or originated; (iii) time at which the modification or cancellation is received or originated (using timestamps pursuant to Section 6.8 of the CAT NMS Plan); (iv) price and remaining size of the order, if modified; (v) other changes in the Material Terms of the Order, if modified; and (vi) whether the modification or cancellation instruction was given by the Customer or was initiated by the Industry Member or Participant. Id. at Section 6.3(d)(iv).

354 For an “order [that] is executed, in whole or in part,” the CAT NMS Plan specifies the following data elements: (i) CAT-Order-ID; (ii) date of execution; (iii) time of execution (using timestamps pursuant to Section 6.8 of the CAT NMS Plan); (iv) execution capacity (principal, agency or riskless principal); (v) execution price and size; (vi) SRO-Assigned Market Participant Identifier of the Participant or Industry Member executing the order; and (vii) whether the execution was reported pursuant to an effective transaction reporting plan or the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information. Id. at Section 6.3(d)(v).

Reporting and Linkage Requirements.”³⁵⁵ The CAT NMS Plan also requires Industry Member CAT Reporters to report additional data elements for (i) an “order [that] is executed, in whole or in part,”³⁵⁶ (ii) a “trade [that] is cancelled,”³⁵⁷ or (iii) “original receipt or origination of an order.”³⁵⁸ Further, each Participant shall, through Compliance Rules, require Industry Members to record and report to the Central Repository information or additional events as may be prescribed to accurately reflect the complete lifecycle of each Reportable Event.³⁵⁹

11. Timeliness of Data Reporting

Section 6.3(b)(ii) of the CAT NMS Plan requires each Participant to report Participant Data to the Central Repository by 8:00 a.m. ET on the Trading Day following the day the Participant records such data.³⁶⁰ Additionally, a Participant may voluntarily report such data prior to this deadline.³⁶¹ Section 6.4(b)(ii) states that each Participant shall, through its Compliance Rule, require its Industry Members to report Recorded Industry Member Data to the Central Repository by 8:00 a.m. ET on the Trading Day following the day the Industry Member

³⁵⁵ See id. at Section 6.3(d)(vi).

³⁵⁶ For an “order [that] is executed, in whole or in part,” the CAT NMS Plan specifies the following additional data elements: (i) an Allocation Report; (ii) SRO-Assigned Market Participant Identifier of the clearing broker or prime broker, if applicable; and (iii) CAT-Order-ID of any contra-side order(s). Id. at Section 6.4(d)(ii)(A).

³⁵⁷ For a “trade [that] is cancelled,” the CAT NMS Plan specifies the following additional data element: a cancelled trade indicator. Id. at Section 6.4(d)(ii)(B).

³⁵⁸ For “original receipt or origination of an order,” the CAT NMS Plan specifies the following additional data element(s): the Firm Designated ID, Customer Account Information, and Customer Identifying Information for the relevant Customer. Id. at Section 6.4(d)(ii)(C).

³⁵⁹ Id. at Appendix D, Section 3.

³⁶⁰ Id. at Section 6.3(b)(ii); see also id. at Appendix C, Section A.1(a)(ii); Appendix D, Sections 3.1, 6.1.

³⁶¹ Id. at Section 6.3(b)(ii).

records such data, and Received Industry Member Data to the Central Repository by 8:00 a.m. ET on the Trading Day following the day the Industry Member receives such data.³⁶²

Section 6.4(b)(ii) of the CAT NMS Plan also states that each Participant shall, through its Compliance Rule, permit its Industry Members to voluntarily report such data prior to the applicable 8:00 a.m. ET deadline.³⁶³

12. Uniform Format

The CAT NMS Plan does not mandate the format in which data must be reported to the Central Repository.³⁶⁴ Appendix D states that the Plan Processor will determine the electronic format in which data must be reported, and that the format will be described in the Technical Specifications.³⁶⁵ Appendix C specifies that CAT Reporters could be required to report data either in a uniform electronic format, or in a manner that would allow the Central Repository to convert the data to a uniform electronic format, for consolidation and storage.³⁶⁶ Similarly, Sections 6.3(a) and 6.4(a) of the CAT NMS Plan require that CAT Reporters report data to the Central Repository in a format or formats specified by the Plan Processor, approved by the Operating Committee, and compliant with Rule 613.³⁶⁷

³⁶² Id. at Section 6.4(b)(ii).

³⁶³ Id.

³⁶⁴ Id. at Appendix C, Section D.12(f); see also id. at Appendix C, Section A.1(a).

³⁶⁵ Id. at Appendix D, Section 2.1. Appendix D states that more than one format may be allowed to support the various market participants that would report information to the Central Repository. Id.; see also id. at Section 6.9.

³⁶⁶ Id. at Appendix C, Section A.1(b).

³⁶⁷ Id. at Sections 6.3(a), 6.4(a).

The CAT NMS Plan requires that data reported to the Central Repository be stored in an electronic standard format.³⁶⁸ Specifically, Section 6.5(b)(i) of the CAT NMS Plan requires the Central Repository to retain the information collected pursuant to Rule 613(c)(7) and (e)(7) in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention by the Plan Processor for a period of not less than six (6) years.³⁶⁹ Such data must be linked when it is made available to the Participant's regulatory Staff and the Commission.³⁷⁰

13. Symbology

The CAT NMS Plan also addresses the symbology that CAT Reporters must use when reporting CAT Data. The CAT NMS Plan requires CAT Reporters to report data using the listing exchange's symbology. The CAT NMS Plan requires the Plan Processor to create and maintain a symbol history and mapping table, as well as provide a tool to regulators and CAT Reporters showing the security's complete symbol history, along with a start-of-day and end-of-day list of reportable securities for use by CAT Reporters, in .csv format, by 6:00 a.m. on each trading day.³⁷¹ The Participants will be responsible for providing the Plan Processor with issue symbol information, and issue symbol validation must be included in the processing of data submitted by CAT Reporters.³⁷²

³⁶⁸ Pursuant to the Plan, for data consolidation and storage, as noted above, such data must be reported in a uniform electronic format or in a manner that would allow the Central Repository to convert the data to a uniform electronic format. Id. at Appendix C, Section A.1(b).

³⁶⁹ Id. at Section 6.5(b)(i).

³⁷⁰ Id.

³⁷¹ Id. at Appendix D, Section 2.

³⁷² Id. at Appendix C, Section A.1(a).

14. CAT-Reporter-ID

Sections 6.3 and 6.4 of the CAT NMS Plan require CAT Reporters to record and report to the Central Repository an SRO-Assigned Market Participant Identifier³⁷³ for orders and certain Reportable Events to be used by the Central Repository to assign a unique CAT-Reporter-ID³⁷⁴ for purposes of identifying each CAT Reporter associated with an order or Reportable Event (the “Existing Identifier Approach”).³⁷⁵ The CAT NMS Plan requires the reporting of SRO-Assigned Market Participant Identifiers of: the Industry Member receiving or originating an order;³⁷⁶ the Industry Member or Participant from which (and to which) an order is being routed;³⁷⁷ the Industry Member or Participant receiving (and routing) a routed order;³⁷⁸ the Industry Member or Participant executing an order, if an order is executed;³⁷⁹ and the clearing broker or prime broker, if applicable, if an order is executed.³⁸⁰ An Industry Member would report to the Central

³⁷³ The CAT NMS Plan defines an “SRO-Assigned Market Participant Identifier” as “an identifier assigned to an Industry Member by an SRO or an identifier used by a Participant.” Id. at Section 1.1.

³⁷⁴ Rule 613 defines a CAT-Reporter-ID as “a code that uniquely and consistently identifies [a CAT Reporter] for purposes of providing data to the central repository.” 17 CFR 242.613(j)(2).

³⁷⁵ The SROs requested exemptive relief from Rule 613 so that the CAT NMS Plan may permit the Existing Identifier Approach, which would allow a CAT Reporter to report an existing SRO-Assigned Market Participant Identifier in lieu of requiring the reporting of a universal CAT-Reporter-ID. See Exemptive Request Letter, supra note 21, at 19. The Commission granted exemptive relief on March 1, 2016 in order to allow this alternative to be included in the CAT NMS Plan and subject to notice and comment. See Exemption Order, supra note 21.

³⁷⁶ See CAT NMS Plan, supra note 5, at Sections 6.3(d)(i), 6.4(d)(i).

³⁷⁷ Id. at Sections 6.3(d)(ii), 6.4(d)(i).

³⁷⁸ Id. at Sections 6.3(d)(iii), 6.4(d)(i).

³⁷⁹ Id. at Sections 6.3(d)(v), 6.4(d)(i).

³⁸⁰ Id. at Section 6.4(d)(ii)(A)(2). Industry Members are required by the CAT NMS Plan to record and report this information. Id. at Section 6.4(d)(ii).

Repository its existing SRO-Assigned Market Participant Identifier used by the relevant SRO specifically for transactions occurring at that SRO.³⁸¹ Similarly, an exchange reporting CAT Reporter information would report data using the SRO-Assigned Market Participant Identifier used by the Industry Member on that exchange or its systems.³⁸² Over-the-counter (“OTC”) orders and Reportable Events would be reported with an Industry Member’s FINRA SRO-Assigned Market Participant Identifier.³⁸³

The CAT NMS Plan requires the Plan Processor to develop and maintain the mechanism to assign (and to change, if necessary) CAT-Reporter-IDs.³⁸⁴ For the Central Repository to link the SRO-Assigned Market Participant Identifier to the CAT-Reporter-ID, each SRO must submit, on a daily basis, all SRO-Assigned Market Participant Identifiers used by its Industry Members (or itself), as well as information to identify the corresponding market participant (for example, a CRD number or Legal Entity Identifier (“LEI”) to the Central Repository.³⁸⁵ Additionally, each Industry Member shall be required to submit to the Central Repository information sufficient to identify such Industry Member (e.g., CRD number or LEI, as noted

³⁸¹ See Exemption Order, supra note 21, at 31–41.

³⁸² See id. at 20.

³⁸³ Id.

³⁸⁴ See CAT NMS Plan, supra note 5, at Appendix D, Section 10.1. Changes to CAT-Reporter-IDs must be reviewed and approved by the Plan Processor. Id. The CAT NMS Plan also requires the Central Repository to generate and assign a unique CAT-Reporter-ID to all reports submitted to the system based on sub-identifiers that are currently used by CAT Reporters in their order handling and trading processes (described in the Exemption Request as SRO-assigned market participant identifiers). Id. at Appendix D, Section 3; see also Exemption Order, supra note 21, at 31–41.

³⁸⁵ See CAT NMS Plan, supra note 5, at Section 6.3(e)(i).

above).³⁸⁶ The Plan Processor would use the SRO-Assigned Market Participant Identifiers and identifying information (i.e., CRD number or LEI) to assign a CAT-Reporter-ID to each Industry Member and SRO for internal use across all data within the Central Repository.³⁸⁷ The Plan Processor would create and maintain a database in the Central Repository that would map the SRO-Assigned Market Participant Identifiers to the appropriate CAT-Reporter-ID.³⁸⁸

The CAT must be able to capture, store, and maintain current and historical SRO-Assigned Market Participant Identifiers.³⁸⁹ The SRO-Assigned Market Participant Identifier must also be included on the Plan Processor's acknowledgment of its receipt of data files from a CAT Reporter or Data Submitter,³⁹⁰ on daily statistics provided by the Plan Processor after the Central Repository has processed data,³⁹¹ and on a secure website that the Plan Processor would maintain that would contain each CAT Reporter's daily reporting statistics.³⁹² In addition, data validations by the Plan Processor must include confirmation of a valid SRO-Assigned Market Participant Identifier.³⁹³

³⁸⁶ Id. at Section 6.4(d)(vi).

³⁸⁷ See Exemption Order, supra note 21, at 31-41.

³⁸⁸ Id. at 20.

³⁸⁹ Id. at Appendix D, Section 2.

³⁹⁰ See id. at Appendix D, Section 7.1.

³⁹¹ See id. at Appendix D, Section 7.2.

³⁹² See id. at Appendix D, Section 10.1.

³⁹³ See id. at Appendix D, Section 7.2. The CAT NMS Plan also notes that both the CAT-Reporter-ID and the SRO-Assigned Market Participant Identifier would be data fields for the online targeted query tool described in the CAT NMS Plan as providing authorized users with the ability to retrieve processed and/or validated (unlinked) data via an online query screen. See id. at Appendix D, Section 8.1.1.

15. Customer-ID

a. Customer Information Approach

Rule 613(c)(7)(i)(A) requires that for the original receipt or origination of an order, a CAT Reporter report the “Customer-ID(s) for each Customer.”³⁹⁴ “Customer-ID” is defined in Rule 613(j)(5) to mean “with respect to a customer, a code that uniquely and consistently identifies such customer for purposes of providing data to the Central Repository.”³⁹⁵ Rule 613(c)(8) requires that “[a]ll plan sponsors and their members shall use the same Customer-ID and CAT-Reporter-ID for each customer and broker-dealer.”³⁹⁶

In Appendix C, the Participants describe the “Customer Information Approach,”³⁹⁷ an alternative approach to the requirement that a broker-dealer report a Customer-ID for every Customer upon original receipt or origination of an order.³⁹⁸ Under the Customer Information Approach, the CAT NMS Plan would require each broker-dealer to assign a unique Firm Designated ID to each Customer.³⁹⁹ As the Firm Designated ID, broker-dealers would be

³⁹⁴ 17 CFR 242.613(c)(7)(i)(A).

³⁹⁵ 17 CFR 242.613(j)(5).

³⁹⁶ 17 CFR 242.613(c)(8).

³⁹⁷ The SROs requested exemptive relief from Rule 613 so that the CAT NMS Plan may permit the Customer Information Approach, which would require each broker-dealer to assign a unique Firm Designated ID to each trading account and to submit an initial set of information identifying the Customer to the Central Repository, in lieu of requiring each broker-dealer to report a Customer-ID for each Customer upon the original receipt or origination of an order. See Exemptive Request Letter, supra note 21, at 12. The Commission granted exemptive relief on March 1, 2016 in order to allow this alternative to be included in the CAT NMS Plan and subject to notice and comment. See Exemption Order, supra note 21.

³⁹⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(a)(iii).

³⁹⁹ Id. The CAT NMS Plan defines a “Firm Designated ID” as “a unique identifier for each trading account designated by Industry Members for purposes of providing data to the

permitted to use an account number or any other identifier defined by the firm, provided each identifier is unique across the firm for each business date (i.e., a single firm may not have multiple separate customers with the same identifier on any given date).⁴⁰⁰ According to the CAT NMS Plan, broker-dealers would submit an initial set of Customer information to the Central Repository, including, as applicable, the Firm Designated ID, the Customer’s name, address, date of birth, individual tax payer identifier number (“ITIN”)/social security number (“SSN”), individual’s role in the account (e.g., primary holder, joint holder, guardian, trustee, person with power of attorney) and LEI,⁴⁰¹ and/or Large Trader ID (“LTID”), if applicable, which would be updated as set forth in the CAT NMS Plan.⁴⁰²

Under the Customer Information Approach, broker-dealers would be required to report only the Firm Designated ID for each new order submitted to the Central Repository, rather than the “Customer-ID” as defined by Rule 613(c)(j)(5) and as required by Rule 613(c)(7)(i)(A), and the Plan Processor would associate specific Customers and their Customer-IDs with individual

Central Repository, where each such identifier is unique among all identifiers from any given Industry Member for each business date.” See id. at Section 1.1.

⁴⁰⁰ Id. at Appendix C, Section A.1(a)(iii).

⁴⁰¹ The CAT NMS Plan provides that where a validated LEI is available for a Customer or entity, this may obviate a need to report other identifier information (e.g., Customer name, address, EIN). Id. at Appendix C, Section A.1(a)(iii) n.31.

⁴⁰² The CAT NMS Plan states that the Participants anticipate that Customer information that is initially reported to the CAT could be limited to Customer accounts that have, or are expected to have, CAT Reportable Event activity. For example, the CAT NMS Plan notes accounts that are considered open, but have not traded Eligible Securities in a given time frame, may not need to be pre-established in the CAT, but rather could be reported as part of daily updates after they have CAT Reportable Event activity. Id. at Appendix C, Section A.1(a)(iii) n.32.

order events based on the reported Firm Designated IDs.⁴⁰³ Within the Central Repository, each Customer would be uniquely identified by identifiers or a combination of identifiers such as an ITIN/SSN, date of birth, and, as applicable, LEI and LTID.⁴⁰⁴ The Plan Processor would be required to use these unique identifiers to map orders to specific Customers across all broker-dealers.⁴⁰⁵ To ensure information identifying a Customer is updated, broker-dealers would be required to submit to the Central Repository daily updates for reactivated accounts, newly established or revised Firm Designated IDs, or associated reportable Customer information.⁴⁰⁶

Appendix C provides additional requirements that the Plan Processor must meet under the Customer Information Approach.⁴⁰⁷ The Plan Processor must maintain information of sufficient detail to uniquely and consistently identify each Customer across all CAT Reporters, and associated accounts from each CAT Reporter, and must document and publish, with the approval of the Operating Committee, the minimum list of attributes to be captured to maintain

⁴⁰³ See id. at Appendix C, Section A.1(a)(iii). The CAT NMS Plan also requires Industry Members to report “Customer Account Information” upon the original receipt of origination of an order. See CAT NMS Plan, supra note 5, at Sections 1.1, 6.4(d)(ii)(C).

⁴⁰⁴ See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(a)(iii).

⁴⁰⁵ Id.

⁴⁰⁶ The CAT NMS Plan notes that because reporting to the CAT is on an end-of-day basis, intra-day changes to information could be captured as part of the daily updates to the information. To ensure the completeness and accuracy of Customer information and associations, in addition to daily updates, broker-dealers would be required to submit periodic full refreshes of Customer information to the CAT. The scope of the “full” Customer information refresh would need to be further defined, with the assistance of the Plan Processor, to determine the extent to which inactive or otherwise terminated accounts would need to be reported. Id. at Appendix C, Section A.1(a)(iii) n.33.

⁴⁰⁷ See id. at Appendix C, Section A.1(a)(iii).

this association.⁴⁰⁸ In addition, the Plan Processor must maintain valid Customer and Customer Account Information⁴⁰⁹ for each trading day and provide a method for Participants and the Commission to easily obtain historical changes to that information (e.g., name changes, address changes).⁴¹⁰ The Plan Processor also must design and implement a robust data validation process for submitted Firm Designated IDs, Customer Account Information and Customer Identifying Information, and be able to link accounts that move from one CAT Reporter to another due to mergers and acquisitions, divestitures, and other events.⁴¹¹ Under the Customer Information Approach, Industry Members will initially submit full account lists for all active accounts to the Plan Processor and subsequently submit updates and changes on a daily basis.⁴¹² Finally, the Plan Processor must have a process to periodically receive full account lists to ensure the

⁴⁰⁸ Id. Section 9.1 of Appendix D also addresses, among other things, the minimum attributes that CAT must capture for Customers and the validation process for such attributes. Id. at Appendix D, Section 9.1.

⁴⁰⁹ Id. at Appendix D, Section 9.1. In relevant part, “Customer Account Information” is defined in the Plan to include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable). See id. at Section 1.1.

⁴¹⁰ See id. at Appendix C, Section A.1(a)(iii).

⁴¹¹ Id. The CAT NMS Plan defines “Customer Identifying Information” to mean “information of sufficient detail to identify a Customer, including, but not limited to, (a) with respect to individuals: name, address, date of birth, individual tax payer identification number (“ITIN”)/social security number (“SSN”), individual’s role in the account (e.g., primary holder, joint holder, guardian, trustee, person with the power of attorney); and (b) with respect to legal entities: name, address, Employer Identification Number (“EIN”)/LEI or other comparable common entity identifier, if applicable; provided, however, where the LEI or other common entity identifier is provided, information covered by such common entity identifier (e.g., name, address) would not need to be separately submitted to the Central Repository.” See id. at Section 1.1.

⁴¹² Id. at Appendix C, Section A.1(a)(iii).

completeness and accuracy of the account database.⁴¹³

b. Account Effective Date vs. Account Open Date

Rule 613(c)(7)(viii)(B) requires broker-dealers to report to the Central Repository “Customer Account Information” upon the original receipt or origination of an order.⁴¹⁴ The CAT NMS Plan defines “Customer Account Information” to include, in part, the Customer’s account number, account type, customer type, date account opened and LTID (if applicable).⁴¹⁵ The Plan, however, provides that in two limited circumstances, a broker-dealer could report the “Account Effective Date” in lieu of the date an account was opened.⁴¹⁶ The first circumstance is where a relationship identifier—rather than an actual parent account—has been established for an institutional Customer relationship.⁴¹⁷ In this case, no account open date is available for the institutional Customer parent relationship because there is no parent account, and for the same reason, there is no account number or account type available.⁴¹⁸ Thus, the Plan provides that in this circumstance, a broker-dealer could report the “Account Effective Date” of the relationship

⁴¹³ Id.

⁴¹⁴ 17 CFR 242.613(c)(7)(viii)(B). “Customer Account Information” is defined in Rule 613(j)(4) to “include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable).” 17 CFR 242.613(j)(4).

⁴¹⁵ See CAT NMS Plan, supra note 5, at Section 1.1.

⁴¹⁶ Id. The SROs requested exemptive relief from Rule 613 so that the CAT NMS Plan may permit broker-dealers to report to the Central Repository the “effective date” of an account in lieu of requiring each broker-dealer to report the date the account was opened in certain limited circumstances. See Exemptive Request Letter, supra note 21, at 13. The Commission granted exemptive relief on March 1, 2016 in order to allow this alternative to be included in the CAT NMS Plan and subject to notice and comment. See Exemption Order, supra note 21.

⁴¹⁷ See Exemption Order, supra note 21; see also September 2015 Supplement, supra note 21, at 4–5.

⁴¹⁸ See September 2015 Supplement, supra note 21, at 6.

in lieu of an account open date.⁴¹⁹ Further, the Plan provides that where such an institutional Customer relationship was established before the broker-dealer’s obligation to report audit trail data, the “Account Effective Date” would be either (i) the date the broker-dealer established the relationship identifier, or (ii) the date when trading began (i.e., the date the first order was received) using the relevant relationship identifier, and if both dates are available and differ, the earlier date.⁴²⁰ Where such relationships are established after the broker-dealer’s obligation to report audit trail data is required, the “Account Effective Date” would be the date the broker-dealer established the relationship identifier and would be no later than the date the first order was received.⁴²¹ Regardless of when the relationship was established for such institutional Customers, the Plan provides that broker-dealers may report the relationship identifier in place of Rule 613(c)(7)(viii)(B)’s requirement to report the “account number,” and report “relationship” in place of “account type.”⁴²²

The second circumstance where a broker-dealer may report the “Account Effective Date” rather than the date an account was opened as required in Rule 613(c)(7)(viii)(B) is when particular legacy system data issues prevent a broker-dealer from providing an account open date for any type of account (i.e., institutional, proprietary or retail) that was established before the CAT’s implementation.⁴²³ According to the Plan, these legacy system data issues may arise because:

⁴¹⁹ See CAT NMS Plan, supra note 5, at Section 1.1.

⁴²⁰ Id.

⁴²¹ Id.

⁴²² Id.

⁴²³ Id.; see also September 2015 Supplement, supra note 21, at 7–9.

- (1) A broker-dealer has switched back office providers or clearing firms and the new back office/clearing firm system identifies the account open date as the date the account was opened on the new system;
- (2) A broker-dealer is acquired and the account open date becomes the date that an account was opened on the post-merger back office/clearing firm system;
- (3) Certain broker-dealers maintain multiple dates associated with accounts in their systems and do not designate in a consistent manner which date constitutes the account open date, as the parameters of each date are determined by the individual broker-dealer; or
- (4) No account open date exists for a proprietary account of a broker-dealer.⁴²⁴

Thus, when legacy systems data issues arise due to one of the four reasons above and no account open date is available, the Plan provides that broker-dealers would be permitted to report an “Account Effective Date” in lieu of an account open date.⁴²⁵ When the legacy systems data issues and lack of account open date are attributable to above reasons (1) or (2), the “Account Effective Date” would be the date the account was established, either directly or via a system transfer, at the relevant broker-dealer.⁴²⁶ When the legacy systems data issues and lack of account open date are attributable to above reason (3), the “Account Effective Date” would be the earliest available date.⁴²⁷ When the legacy systems data issues and lack of account open date are attributable to above reason (4), the “Account Effective Date” would be (i) the date

⁴²⁴ See CAT NMS Plan, supra note 5, at Section 1.1.

⁴²⁵ Id.

⁴²⁶ Id.

⁴²⁷ Id.

established for the proprietary account in the broker-dealer or its system(s), or (ii) the date when proprietary trading began in the account, i.e., the date on which the first order was submitted from the account.⁴²⁸

c. Modification/Cancellation

Rule 613(c)(7)(iv)(F) requires that “[t]he CAT-Reporter-ID of the broker-dealer or Customer-ID of the person giving the modification or cancellation instruction” be reported to the Central Repository.⁴²⁹ Because the Customer Information Approach no longer requires, as permitted by the Exemption Order, that a Customer-ID be reported upon original receipt or origination of an order, and because reporting the Customer-ID of the specific person that gave the modification or cancellation instruction would result in an inconsistent level of information regarding the identity of the person giving the modification or cancellation instruction versus the identity of the Customer that originally received or originated an order, Section 6.3(d)(iv)(F) of the CAT NMS Plan modifies the requirement in Rule 613 and instead requires CAT Reporters to report whether the modification or cancellation instruction was “given by the Customer or was initiated by the Industry Member or Participant.”⁴³⁰

⁴²⁸ Id.

⁴²⁹ 17 CFR 242.613(c)(7)(iv)(F) (emphasis added).

⁴³⁰ See CAT NMS Plan, supra note 5, at Section 6.3(d)(iv)(F). The SROs requested exemptive relief from Rule 613 so that the CAT NMS Plan may permit CAT Reporters to report whether a modification or cancellation instruction was given by the Customer associated with the order, or was initiated by the broker-dealer or exchange associated with the order, in lieu of requiring CAT Reporters to report the Customer-ID of the person giving the modification or cancellation instruction. See Exemptive Request Letter, supra note 21, at 12–13. The Commission granted exemptive relief on March 1, 2016 in order to allow this alternative to be included in the CAT NMS Plan and subject to notice and comment. See Exemption Order, supra note 21.

16. Order Allocation Information

Section 6.4(d)(ii)(A)(1) of the CAT NMS Plan provides that each Participant through its Compliance Rule must require that Industry Members record and report to the Central Repository an Allocation Report that includes the Firm Designated ID when an execution is allocated in whole or part.⁴³¹ The CAT NMS Plan defines an Allocation Report as “a report made to the Central Repository by an Industry Member that identifies the Firm Designated ID for any account(s), including subaccount(s), to which executed shares are allocated and provides the security that has been allocated, the identifier of the firm reporting the allocation, the price per share of shares allocated, the side of shares allocated, the number of shares allocated to each account, and the time of the allocation.”⁴³² The CAT NMS Plan explains, for the avoidance of doubt, that an Allocation Report shall not be required to be linked to particular orders or executions.⁴³³

17. Options Market Maker Quotes

Section 6.4(d)(iii) of the CAT NMS Plan states that, with respect to the reporting

⁴³¹ See CAT NMS Plan, supra note 5, at Section 6.4(d)(ii)(A)(1); see also April 2015 Supplement, supra note 21. The SROs requested exemptive relief from Rule 613 so that the CAT NMS Plan may permit Industry Members to record and report to the Central Repository an Allocation Report that includes the Firm Designated ID when an execution is allocated in whole or part in lieu of requiring the reporting of the account number for any subaccount to which an execution is allocated, as is required by Rule 613. See Exemptive Request Letter, supra note 21, at 26–27. The Commission granted exemptive relief on March 1, 2016 in order to allow this alternative to be included in the CAT NMS Plan and subject to notice and comment. See Exemption Order, supra note 21.

⁴³² See CAT NMS Plan, supra note 5, at Section 1.1; see also April 2015 Supplement, supra note 21.

⁴³³ See CAT NMS Plan, supra note 5, at Section 1.1.

obligations of an Options Market Maker under Sections 6.3(d)(ii) and (iv) regarding its quotes⁴³⁴ in Listed Options, such quotes shall be reported to the Central Repository by the relevant Options Exchange in lieu of reporting by the Options Market Maker.⁴³⁵ Section 6.4(d)(iii) further states that each Participant that is an Options Exchange shall, through its Compliance Rule, require its Industry Members that are Options Market Makers to report to the Options Exchange the time at which a quote in a Listed Option is sent to the Options Exchange (and, if applicable, the time of any subsequent quote modification and/or cancellation where such modification or cancellation is originated by the Options Market Maker).⁴³⁶ Such time information also shall be reported to the Central Repository by the Options Exchange in lieu of reporting by the Options Market Maker.⁴³⁷

⁴³⁴ Rule 613(c)(7) provides that the CAT NMS Plan must require reporting of the details for each order and each Reportable Event, including the routing and modification or cancellation of an order. 17 CFR 242.613(c)(7). Rule 613(j)(8) defines “order” to include “any bid or offer.” 17 CFR 242.613(j)(8).

⁴³⁵ See CAT NMS Plan, supra note 5, at Section 6.4(d)(iii). The SROs requested exemptive relief from Rule 613 so that the CAT NMS Plan may permit Options Market Maker quotes to be reported to the Central Repository by the relevant Options Exchange in lieu of requiring that such reporting be done by both the Options Exchange and the Options Market Maker, as is required by Rule 613. See Exemptive Request Letter, supra note 21, at 2. In accord with the exemptive relief requested, the SROs committed to require Options Market Makers to report to the Exchange the time at which a quote in a Listed Option is sent to the Options Exchange. Id. at 3. The Commission granted exemptive relief on March 1, 2016 in order to allow this alternative to be included in the CAT NMS Plan and subject to notice and comment. See Exemption Order, supra note 21.

⁴³⁶ See CAT NMS Plan, supra note 5, at Section 6.4(d)(iii).

⁴³⁷ Id.

18. Primary Market Transactions, Debt Securities and Futures

Rule 613 and the CAT NMS Plan do not require the reporting of audit trail data for Primary Market Transactions,⁴³⁸ debt securities, and futures. However, Rule 613(i) requires that, within six months after the effective date of the CAT NMS Plan, the SROs shall jointly provide to the Commission “a document outlining how such exchanges and associations could incorporate into the consolidated audit trail information with respect to equity securities that are not NMS securities,⁴³⁹ debt securities, primary market transactions in equity securities that are not NMS securities, and primary market transactions in debt securities, including details for each order and reportable event that may be required to be provided, which market participants may be required to provide the data, an implementation timeline, and a cost estimate.”⁴⁴⁰

19. Error Rates

The CAT NMS Plan defines Error Rate as “the percentage of [R]eportable [E]vents collected by the [C]entral [R]epository in which the data reported does not fully and accurately

⁴³⁸ The CAT NMS Plan defines “Primary Market Transaction” to mean “any transaction other than a secondary market transaction and refers to any transaction where a Person purchases securities in an offering.” Id. at Section 1.1.

⁴³⁹ The Commission notes that in the CAT NMS Plan some non-NMS equities (specifically, OTC equity securities) are required to be reported. Id. at Sections 1.1, 6.3 (requiring Eligible Securities data to be reported, and where Eligible Securities is defined as all NMS securities and all OTC equity securities).

⁴⁴⁰ See 17 CFR 242.613(i); see also CAT NMS Plan, supra note 5, at Section 6.11. The CAT NMS Plan defines “NMS Securities” to mean “any security or class of securities for which transaction reports are collected, processed, and made available pursuant to an effective transaction reporting plan, or an effective national market system plan for reporting transactions in Listed Options.” See CAT NMS Plan, supra note 5, at Section 1.1. The CAT NMS Plan defines “OTC Equity Securities” as “any equity security, other than an NMS Security, subject to prompt last sale reporting rules of a registered national securities association and reported to one of such association’s equity trade reporting facilities.” Id.

reflect the order event that occurred in the market.”⁴⁴¹ Under the CAT NMS Plan, the Operating Committee sets the maximum Error Rate that the Central Repository would tolerate from a CAT Reporter reporting data to the Central Repository.⁴⁴² The Operating Committee reviews and resets the maximum Error Rate, at least annually.⁴⁴³ If a CAT Reporter reports CAT Data to the Central Repository with errors such that their error percentage exceeds the maximum Error Rate, then such CAT Reporter would not be in compliance with the CAT NMS Plan or Rule 613.⁴⁴⁴ As such, “the Participants as Participants or the SEC may take appropriate action for failing to comply with the reporting obligations under the CAT NMS Plan and SEC Rule 613.”⁴⁴⁵ The CAT NMS Plan, however, does not detail what specific compliance enforcement provisions would apply if a CAT Reporter exceeds the maximum Error Rate.⁴⁴⁶

The CAT NMS Plan sets the initial maximum Error Rate at 5% for any data reported pursuant to subparagraphs (3) and (4) of Rule 613(c).⁴⁴⁷ The SROs highlight that “the Central Repository will require new reporting elements and methods for CAT Reporters and there will be a learning curve when CAT Reporters begin to submit data to the Central Repository” in support of a 5% initial rate.⁴⁴⁸ Further, the SROs state that “many CAT Reporters may have never been

⁴⁴¹ See CAT NMS Plan, supra note 5, at Section 1.1; see also Rule 613(j)(6).

⁴⁴² Id. at Section 6.5(d)(i).

⁴⁴³ Id. at Appendix C, Section A.3(b).

⁴⁴⁴ Id. at Appendix C, Section A.3(b); Rule 613(g)–(h).

⁴⁴⁵ Id. at Appendix C, Section A.3(b).

⁴⁴⁶ See Notice, supra note 5, at 30645.

⁴⁴⁷ See CAT NMS Plan, supra note 5, at Section 6.5(d)(i).

⁴⁴⁸ Id. at Appendix C, Section A.3(b).

obligated to report data to an audit trail.”⁴⁴⁹ The SROs believe an initial maximum Error Rate of 5% “strikes the balance of making allowances for adapting to a new reporting regime, while ensuring that the data provided to regulators will be capable of being used to conduct surveillance and market reconstruction.”⁴⁵⁰ In the CAT NMS Plan, the Participants compared the contemplated Error Rates of CAT Reporters to the error rates of OATS reporters in the time periods immediately following three significant OATS releases in the last ten years.⁴⁵¹ The Participants state that for the three comparative OATS releases⁴⁵²: an average of 2.42% of order events did not pass systemic validations; an average of 0.36% of order events were not submitted in a timely manner; an average of 0.86% of orders were unsuccessfully matched to a trade reporting facility trade report; an average of 3.12% of OATS Route Reports were unsuccessfully matched to an exchange order; and an average of 2.44% of OATS Route Reports were unsuccessfully matched to a report by another reporting entity.⁴⁵³

The Participants, moreover, anticipate reviewing and resetting the maximum Error Rate once Industry Members (excluding Small Industry Members) begin to report to the Central Repository and again once Small Industry Members report to the Central Repository.⁴⁵⁴

449 Id.

450 Id.

451 Id. The SROs note that the three comparative releases are known as “(1) OATS Phase III, which required manual orders to be reported to OATS; (2) OATS for OTC Securities which required OTC equity securities to be reported to OATS; and (3) OATS for NMS which required all NMS stocks to be reported to OATS.” Id.

452 Id. The SROs note that the calculated “combined average error rates for the time periods immediately following [the OATS] release across five significant categories for these three releases” was used in setting in the initial maximum Error Rate. Id.

453 Id.

454 Id.

The Participants thus propose a phased approach to lowering the maximum Error Rates among CAT Reporters based on the period of time reporting to the Central Repository and whether the CAT Reporters are Participants, large broker-dealers or small broker-dealers.⁴⁵⁵ The Plan sets forth a goal of the following maximum Error Rates⁴⁵⁶ where “Year(s)” refers to year(s) after the CAT NMS Plan’s date of effectiveness:

Table 1
Maximum Error Rates Schedule

	One Year	Two Years	Three Years	Four Years
Participants	5%	1%	1%	1%
Large Industry Members	N/A	5%	1%	1%
Small Industry Members	N/A	N/A	5%	1%

The CAT NMS Plan requires the Plan Processor to: (i) measure and report errors every business day;⁴⁵⁷ (ii) provide CAT Reporters daily statistics and error reports as they become available, including a description of such errors;⁴⁵⁸ (iii) provide monthly reports to CAT

⁴⁵⁵ Id.

⁴⁵⁶ Id.

⁴⁵⁷ Id. The CAT NMS Plan sets forth that the Plan Processor shall provide the Operating Committee with regular Error Rate reports. Id. at Section 6.1(o)(v). The Error Rate reports shall include each of the following—if the Operating Committee deems them necessary or advisable—”Error Rates by day and by delta over time, and Compliance Thresholds by CAT Reporter, by Reportable Event, by age before resolution, by symbol, by symbol type (e.g., ETF and Index) and by event time (by hour and cumulative on the hour)[.]” Id.

⁴⁵⁸ See id. at Appendix C, Section A.3(b).

Reporters that detail a CAT Reporter’s performance and comparison statistics;⁴⁵⁹ (iv) define educational and support programs for CAT Reporters to minimize Error Rates;⁴⁶⁰ and (v) identify, daily, all CAT Reporters exceeding the maximum allowable Error Rate.⁴⁶¹ To timely correct data-submitted errors to the Central Repository, the Participants require that the Central Repository receive and process error corrections at all times.⁴⁶² Further, the CAT NMS Plan requires that CAT Reporters be able to submit error corrections to the Central Repository through a web-interface or via bulk uploads or file submissions, and that the Plan Processor, subject to the Operating Committee’s approval, support the bulk replacement of records and the reprocessing of such records.⁴⁶³ The Participants, furthermore, require that the Plan Processor identify CAT Reporter data submission errors based on the Plan Processor’s validation processes.⁴⁶⁴

⁴⁵⁹ See id.

⁴⁶⁰ See id. at Appendix D, Section 10.1. The CAT NMS Plan sets forth support programs that shall include educational programs, including FAQs, a dedicated help desk, industry-wide trainings, certifications, industry-wide testing, maintaining Technical Specifications with defined intervals for new releases/updates, emailing CAT Reporter data outliers, conducting annual assessments, using test environments prior to releasing new code to production, and imposing CAT Reporter attendance requirements for testing sessions and educational and industry-wide trainings. Id.

⁴⁶¹ See id. at Appendix D, Section 10.4.

⁴⁶² See id. at Appendix C, Section A.3(b).

⁴⁶³ See id.

⁴⁶⁴ See id. At a minimum, the processes would include validating the data’s file format, CAT Data format, type, consistency, range, logic, validity, completeness, timeliness and linkage. See id. at Appendix D, Section 7.2.

20. Retirement of Existing Trade and Order Data Rules and Systems

a. Duplicative or Partially Duplicative Rules and Systems

As required by Rule 613(a)(1)(ix),⁴⁶⁵ the CAT NMS Plan provides a plan to eliminate rules and systems that will be rendered duplicative by the CAT.⁴⁶⁶ Under the CAT NMS Plan, each Participant will initiate an analysis of its rules and systems to determine which require information that is duplicative of the information available to the Participants through the Central Repository. The CAT NMS Plan states that each Participant has begun reviewing its rulebook and is waiting for the publication of the final reporting requirements to the Central Repository to complete its analysis. According to the Plan, each Participant should complete its analysis within twelve months after Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository (or a later date to be determined by each Participant if sufficient data is not available to complete the analysis in that timeframe).⁴⁶⁷

Similarly, the CAT NMS Plan provides that each Participant will analyze which of its rules and systems require information that is partially duplicative of the information available to the Participants through the Central Repository.⁴⁶⁸ According to the CAT NMS Plan, this analysis should include a determination as to: (i) whether the Participant should continue to collect the duplicative information available in the Central Repository; (ii) whether the Participant can use the duplicative information made available in the Central Repository without degrading the effectiveness of the Participant's rules or systems; and (iii) whether the Participant

⁴⁶⁵ 17 CFR 242.613(a)(1)(ix).

⁴⁶⁶ See CAT NMS Plan, supra note 5, at Section 6.7(d); Appendix C, Section C.9.

⁴⁶⁷ Id. at Appendix C, Section C.9.

⁴⁶⁸ Id.

should continue to collect the non-duplicative information or, alternatively, whether it should be added to information collected by the Central Repository. The CAT NMS Plan states that each Participant has begun reviewing its rulebook and is waiting for the publication of the final reporting requirements to the Central Repository to complete its analysis. According to the Plan, each Participant should complete this analysis within eighteen months after Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository (or a later date to be determined by each Participant if sufficient data is not available to complete the analysis in that timeframe).⁴⁶⁹

The CAT NMS Plan also discusses the elimination of specific trade and order data collection systems that may be duplicative or partially duplicative of CAT.⁴⁷⁰ With respect to FINRA's OATS, the CAT NMS Plan notes that FINRA's ability to retire OATS is dependent on whether the Central Repository contains complete and accurate CAT Data that is sufficient to ensure that FINRA can effectively conduct surveillance and investigations of its members for potential violations of FINRA rules and federal laws and regulations.⁴⁷¹ Based on an analysis conducted by the Participants, there are 33 data elements currently captured in OATS that are not specified in SEC Rule 613. The Plan notes that the Participants believe it is appropriate to incorporate data elements into the Central Repository that are necessary to retire OATS, and that these additional data elements will increase the likelihood that the Central Repository will include sufficient order information to ensure that FINRA can continue to perform its surveillance with CAT Data rather than OATS data and can more quickly eliminate OATS.

⁴⁶⁹ Id.

⁴⁷⁰ Id.

⁴⁷¹ Id.

However, the Plan notes that OATS cannot be entirely eliminated until all FINRA members who currently report to OATS are reporting to the Central Repository, and that there will likely be some period of dual reporting until FINRA can verify that the data in the Central Repository is of sufficient quality for surveillance purposes and that data reported to the Central Repository meets the Error Rate standards set out in the CAT NMS Plan.⁴⁷² With respect to rules and systems other than OATS, the CAT NMS Plan notes that based on preliminary industry analyses, broker-dealer recordkeeping and large trader reporting requirements under SEC Rule 17h-1 could potentially be eliminated. The Plan, however, notes that large trader self-identification and reporting responsibilities on Form 13H appear not be covered by the CAT.⁴⁷³

Based on these analyses of duplicative or partially duplicative rules, the CAT NMS Plan provides that each Participant will prepare appropriate rule change filings to implement the rule modifications or deletions that can be made.⁴⁷⁴ The rule change filings should describe the process for phasing out the requirements under the relevant rule. Under the CAT NMS Plan, each Participant will file with the SEC the relevant rule change filing to eliminate or modify its rules within six months of the Participant's determination that such modification or deletion is appropriate.⁴⁷⁵ Similarly, the CAT NMS Plan provides that each Participant will analyze the most appropriate and expeditious timeline and manner for eliminating duplicative and partially duplicative rules and systems. Upon the Commission's approval of relevant rule changes, each Participant will implement this timeline. In developing these timelines, each Participant must

⁴⁷² Id.

⁴⁷³ Id.

⁴⁷⁴ Id.

⁴⁷⁵ Id.

consider when the quality of CAT Data will be sufficient to meet the surveillance needs of the Participants (i.e., to sufficiently replace current reporting data) before existing rules and systems can be eliminated.⁴⁷⁶

b. Non-Duplicative Rules and Systems

The CAT NMS Plan provides that each Participant will conduct an analysis to determine which of its rules and systems related to monitoring quotes, orders, and executions provide information that is not rendered duplicative by the CAT.⁴⁷⁷ Under the CAT NMS Plan, each Participant must analyze: (i) whether collection of such information remains appropriate; (ii) if still appropriate, whether such information should continue to be separately collected or should instead be incorporated into the consolidated audit trail; and, (iii) if no longer appropriate, how the collection of such information could be efficiently terminated, the steps the Participants would need to take to seek Commission approval for the elimination of such rules and systems, and a timetable for such elimination. Each Participant should complete this analysis within eighteen months after Industry Members (other than Small Industry Members) are required to begin reporting data to the Central Repository (or a later date to be determined by each Participant if sufficient data is not available to complete the analysis in that timeframe).⁴⁷⁸

c. Elimination of SEC Rules

In addition, to the extent that the Commission eliminates rules that require information that is duplicative of information available through the Central Repository, the CAT NMS Plan provides that each Participant will analyze its rules and systems to determine whether any

⁴⁷⁶ Id.

⁴⁷⁷ Id.

⁴⁷⁸ Id.

modifications to such rules or systems are necessary (e.g., to delete references to outdated SEC rules) to support data requests made pursuant to such SEC rules.⁴⁷⁹ Each Participant should complete its analysis within three months after the SEC approves the deletion or modification of an SEC rule related to the information available through the Central Repository. The CAT NMS Plan also provides that Participants will coordinate with the Commission regarding modification of the CAT NMS Plan to include information sufficient to eliminate or modify those Exchange Act rules or systems that the Commission deems appropriate.⁴⁸⁰

21. Regulatory Access

Under Section 6.5(c) of the CAT NMS Plan and as discussed above, the Plan Processor must provide regulators access to the Central Repository for regulatory and oversight purposes and create a method of accessing CAT Data that includes the ability to run complex searches and generate reports.⁴⁸¹ Section 6.10(c) requires regulator access by two different methods: (1) an online targeted query tool with predefined selection criteria to choose from; and (2) user-defined direct queries and bulk extractions of data via a query tool or language allowing querying of all available attributes and data sources.⁴⁸² Additional requirements concerning regulator access appear in Section 8 of Appendix D.⁴⁸³

⁴⁷⁹ Id.

⁴⁸⁰ Id.

⁴⁸¹ Id. at Section 6.5(c). Appendix C provides objective milestones to assess progress concerning regulator access to the Central Repository. See id. at Appendix C, Section C.10(d).

⁴⁸² Id. at Section 6.10(c). Section 6.10(c) also requires the Plan Processor to reasonably assist regulatory Staff with queries, submit queries on behalf of regulatory Staff as requested, and maintain a help desk to assist regulatory Staff with questions concerning CAT Data. Id.

⁴⁸³ See id. at Appendix D, Section 8.

The CAT NMS Plan requires that the CAT must support a minimum of 3,000 regulatory users and at least 600 such users accessing the CAT concurrently without an unacceptable decline in performance.⁴⁸⁴ Moreover, the CAT must support an arbitrary number of user roles and, at a minimum, include defined roles for both basic and advanced regulatory users.⁴⁸⁵

a. Online Targeted Query Tool

Sections 8.1.1, 8.1.2, and 8.1.3 of Appendix D contain further specifications for the online targeted query tool.⁴⁸⁶ The tool must allow for retrieval of processed and/or validated (unlinked) data via an online query screen that includes a choice of a variety of pre-defined selection criteria.⁴⁸⁷ Targeted queries must include date(s) and/or time range(s), as well as one or more of a variety of fields listed in Section 8.1.1 (e.g., product type, CAT-Reporter-ID, and Customer-ID).⁴⁸⁸ Targeted queries would be logged such that the Plan Processor could provide monthly reports to the SROs and the SEC concerning metrics on performance and data usage of the search tool.⁴⁸⁹ The CAT NMS Plan further requires that acceptable response times for the targeted search be in increments of less than one minute; for complex queries scanning large volumes of data or large result sets (over one million records) response times must be available within 24 hours of the request; and queries for data within one business date of a 12-month

⁴⁸⁴ Id. at Appendix D, Section 8.1.

⁴⁸⁵ Id.

⁴⁸⁶ Id. at Appendix D, Sections 8.1.1–8.1.3.

⁴⁸⁷ Id. at Appendix D, Section 8.1.1.

⁴⁸⁸ Id.

⁴⁸⁹ Id.

period must return results within three hours regardless of the complexity of criteria.⁴⁹⁰ Under the CAT NMS Plan, regulators may access all CAT Data except for PII data (access to which would be limited to an authorized subset of Participant and Commission employees) and the Plan Processor must work with regulators to implement a process for providing them with access and routinely verifying a list of active users.⁴⁹¹

b. User-Defined Direct Queries and Bulk Extraction of Data

Section 8.2 of Appendix D outlines the requirements for user-defined direct queries and bulk extraction of data, which regulators would use to obtain large data sets for internal surveillance or market analysis.⁴⁹² Under the CAT NMS Plan, regulators must be able to create, save, and schedule dynamic queries that would run directly against processed and/or unlinked CAT Data.⁴⁹³ Additionally, CAT must provide an open application program interface (“API”) that allows use of analytic tools and database drivers to access CAT Data.⁴⁹⁴ Queries submitted through the open API must be auditable and the CAT System must contain the same level of control, monitoring, logging, and reporting as the online targeted query tool.⁴⁹⁵ The Plan Processor must also provide procedures and training to regulators that would use the direct query

⁴⁹⁰ Id. at Appendix D, Section 8.1.2. Appendix D, Section 8.1.2 contains further performance requirements applicable to data and the architecture of the online query tool. Id.

⁴⁹¹ Id. at Appendix D, Section 8.1.3.

⁴⁹² Id. at Appendix D, Section 8.2.

⁴⁹³ Id.

⁴⁹⁴ Id.

⁴⁹⁵ Id. Direct queries must not return or display PII data but rather display non-PII unique identifiers (e.g., Customer-ID or Firm Designated ID). The PII corresponding to these identifiers could be gathered using the PII workflow described in Appendix D, Data Security, PII Data Requirements. See id. at Appendix D, Section 4.1.6.

feature.⁴⁹⁶ Sections 8.2.1 and 8.2.2 of Appendix D contain additional specifications for user-defined direct queries and bulk data extraction, respectively.⁴⁹⁷

c. Regulatory Access Schedule

Section A.2 of Appendix C addresses the time and method by which CAT Data would be available to regulators.⁴⁹⁸ Section A.2(a) requires that data be available to regulators any point after the data enters the Central Repository and passes basic format validations.⁴⁹⁹ After errors are communicated to CAT Reporters on T+1, CAT Reporters would be required to report corrected data back to the Central Repository by 8:00 a.m. ET on T+3.⁵⁰⁰ Regulators must then have access to corrected and linked order and Customer data by 8:00 a.m. ET on T+5.⁵⁰¹ Section A.2(b) generally describes Bidders' approaches regarding regulator access and use of CAT Data and notes that although the SROs set forth the standards the Plan Processor must meet, they do not endorse any particular approach.⁵⁰² Section A.2(c) outlines requirements the Plan Processor must meet for report building and analysis regarding data usage by regulators, consistent with, and in addition to, the specifications outlined in Section 8 of Appendix D.⁵⁰³

⁴⁹⁶ Id. at Appendix D, Section 8.2.

⁴⁹⁷ Id. at Appendix D, Sections 8.2.1 and 8.2.2.

⁴⁹⁸ Id. at Appendix C, Section A.2.

⁴⁹⁹ Id. at Appendix C, Section A.2(a). Appendix C, Section A.3(e) indicates this would be no later than noon EST on T+1. Id. at Appendix C, Section A.3(e).

⁵⁰⁰ Id. at Appendix C, Section A.1(a)(iv); Appendix D, Section 6.1.

⁵⁰¹ Id. at Appendix C, Section A.2(a).

⁵⁰² Id. at Appendix C, Section A.2(b).

⁵⁰³ Id. at Appendix C, Section A.2(c). Appendix C, Section A.2(d) addresses system service level agreements that the SROs and Plan Processor would enter into. Id. at Appendix C, Section A.2(d).

22. Upgrades and New Functionalities

Under Article VI of the CAT NMS Plan, the Plan Processor is responsible for consulting with the Operating Committee and implementing necessary upgrades and new functionalities. In particular, the Plan Processor would be required to, consistent with Appendix D, Upgrade Process and Development of New Functionality, design and implement appropriate policies and procedures governing the determination to develop new functionality for the CAT including, among other requirements, a mechanism by which changes can be suggested by Advisory Committee members, Participants, or the SEC.⁵⁰⁴ The Plan Processor shall, on an ongoing basis and consistent with any applicable policies and procedures, evaluate and implement potential system changes and upgrades to maintain and improve the normal day-to-day operating function of the CAT System.⁵⁰⁵ In consultation with the Operating Committee, the Plan Processor shall, on an as-needed basis and consistent with any applicable operational and escalation policies and procedures, implement such material system changes and upgrades as may be required to ensure

⁵⁰⁴ Id. at Section 6.1(d)(iv). Such policies and procedures also shall: (A) provide for the escalation of reviews of proposed technological changes and upgrades (including as required by Section 6.1(i) and Section 6.1(j) or as otherwise appropriate) to the Operating Committee; and (B) address the handling of surveillance, including coordinated, SEC Rule 17d-2 or RSA surveillance queries and requests for data. Id.

⁵⁰⁵ Id. at Section 6.1(i). Section 11 of Appendix D sets out the obligations of the Plan Processor with respect to the requirements discussed above (e.g., to develop a process to add functionality to CAT, including reviewing suggestions submitted by the Commission). The Plan Processor must create a defined process for developing impact assessments, including implementation timelines for proposed changes, and a mechanism by which functional changes that the Plan Processor wishes to undertake could be reviewed and approved by the Operating Committee. Section 11 further states that the Plan Processor must implement a process to govern changes to CAT (including “business-as-usual” changes and isolated infrastructure changes). Further, Section 11 states that the Plan Processor is required to implement a process governing user testing of changes to CAT functionality and infrastructure. See id. at Appendix D, Section 11.

effective functioning of the CAT System.⁵⁰⁶ Also in consultation with the Operating Committee, the Plan Processor shall, on an as-needed basis, implement system changes and upgrades to the CAT System to ensure compliance with applicable laws, regulations or rules (including those promulgated by the Commission or any Participant).⁵⁰⁷

Appendix D provides additional detail about the obligations of the Plan Processor with respect to CAT Functional Changes, CAT Infrastructure Changes, and Testing of New Changes.⁵⁰⁸ In particular, the Plan Processor is required to propose a process for considering new functions, which must include a mechanism for suggesting changes to the Operating Committee from Advisory Committee members, the Participants and the Commission. The process must also include a method for developing impact assessments, including implementation timelines for proposed changes, and a mechanism by which functional changes that the Plan Processor wishes to undertake could be reviewed and approved by the Operating Committee.⁵⁰⁹

The CAT NMS Plan also requires that the Plan Processor develop a similar process to govern the changes to the Central Repository—*i.e.*, business-as-usual changes that could be performed by the Plan Processor with only a summary report to the Operating Committee, and

⁵⁰⁶ Id. at Section 6.1(j).

⁵⁰⁷ Id. at Section 6.1(k).

⁵⁰⁸ Id. at Appendix D, Section 11.

⁵⁰⁹ Id. at Appendix D, Section 11.1.

infrastructure changes that would require approval by the Operating Committee.⁵¹⁰ Finally, a process for user testing of new changes must be developed by the Plan Processor.⁵¹¹

In addition, the CAT NMS Plan requires that the Plan Processor ensure that the Central Repository's technical infrastructure is scalable (to increase capacity to handle increased reporting volumes); adaptable (to support future technology developments so that new requirements could be incorporated); and current (to ensure, through maintenance and upgrades, that technology is kept current, supported, and operational).⁵¹²

23. Business Continuity and Disaster Recovery

The CAT NMS Plan provides that the Plan Processor must develop disaster recovery and business continuity plans to support the continuation of CAT business operations.⁵¹³ The Plan Processor is required to provide the Operating Committee with regular reports on the CAT System's operation and maintenance that specifically address Participant usage statistics for the Plan Processor and the Central Repository, including capacity planning studies and daily reports called for by Appendix D, as well as business continuity planning and disaster recovery issues for the Plan Processor and the Central Repository, taking into account the business continuity planning and disaster recovery requirements in the Business Continuity Planning/Disaster Recovery ("BCP/DR") Process set forth in Appendix D.⁵¹⁴

⁵¹⁰ Id. at Appendix D, Section 11.2.

⁵¹¹ Id. at Appendix D, Section 11.3.

⁵¹² See id. at Appendix C, Section A.5(a).

⁵¹³ Id. at Appendix D, Sections 5.3–5.4.

⁵¹⁴ Id. at Section 6.1(o)(iii).

The CAT NMS Plan requires the Business Continuity Plan to address protection of data, service for data submissions, processing, data access, support functions and operations.⁵¹⁵ Additionally, the Plan Processor must develop a process to manage and report breaches.⁵¹⁶ A secondary site that is fully equipped for immediate use must be selected to house critical staff necessary for CAT business operations, and planning should consider operational disruption and significant staff unavailability, but the Business Continuity Plan must also establish an effective telecommuting solution for critical staff which must ensure that CAT Data may not be downloaded to equipment that is not CAT-owned or compliant with CAT security requirements.⁵¹⁷ The Business Continuity Plan will include a bi-annual test of CAT operations from the secondary site, and CAT operations staff must maintain and annually test remote access to ensure smooth operations in case of a “site un-availability event.”⁵¹⁸ The Business Continuity Plan must also identify critical third-party dependencies to be involved in tests on an annual basis, and the Plan Processor will develop and annually test a crisis management plan to be invoked in specified circumstances.⁵¹⁹ The Plan Processor must also conduct the following: an annual Business Continuity Audit using an Independent Auditor approved by the Operating Committee; and regular third party risk assessments to verify that security controls are in accordance with NIST SP 800-53.⁵²⁰ Appendix C mandates the use of a hot-warm structure for

515 Id. at Appendix D, Section 5.1.

516 Id. at Appendix D, Section 5.2.

517 Id. at Appendix D, Section 5.3.

518 Id.

519 Id.

520 Id.

disaster recovery, where in the event of a disaster, the software and data would need to be loaded into the backup site for it to become operational.⁵²¹

Appendix D also requires that the Plan Processor provide an industry test environment that is discrete and separate from the production environment, but functionally equivalent to the production environment. The industry test environment must have end-to-end functionality meeting the standards of the production SLA, the performance metrics of the production environment, and management with the same information security policies applicable to the production environment.⁵²² The industry test environment must have minimum availability of 24x6, and must support such things as: testing of technical upgrades by the Plan Processor, testing of CAT code releases impacting CAT Reporters, testing of changes to industry data feeds, industry-wide disaster recovery testing, individual CAT Reporter and Data Submitter testing of their upgrades against CAT interfaces and functionality, and multiple, simultaneous CAT Reporter testing.⁵²³ The Plan Processor must provide the linkage processing of data submitted during industry-wide testing, as well as support for industry testing.⁵²⁴

⁵²¹ Id. at Appendix C, Section 12(o). Appendix D, Section 5, provides details on how the CAT’s BCP/DR process would be structured. In part, Appendix D states, “[a] secondary processing site must be capable of recovery and restoration of services at the secondary site within a minimum of 48 hours, but with the goal of achieving next day recovery after a disaster event. The selection of the secondary site must consider sites with geographic diversity that do not rely on the same utility, telecom and other critical infrastructure services. The processing sites for disaster recovery and business continuity must adhere to the “Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System.” Id. at Appendix D, Section 5.1.

⁵²² Id. at Appendix D, Section 1.2.

⁵²³ Id.

⁵²⁴ Id.

24. Records and Accounting and Dissolution and Termination of the Company

Article IX of the CAT NMS Plan sets forth the Company's obligations and policies related to books and records, accounting, company funds and tax matters.⁵²⁵ The CAT NMS Plan provides that the Company must maintain complete and accurate books and records of the Company in accordance with Rule 17a-1.⁵²⁶ The CAT NMS Plan further provides that books and records will be maintained and be made available at the office of the Plan Processor and/or such other Company designated locations.⁵²⁷ The CAT NMS Plan specifies that all CAT Data and other Company books and records are the property of the Company (and not the property of the Plan Processor), and to the extent in the possession of the Plan Processor, they will be made available to the Commission upon reasonable request.⁵²⁸

Article IX also includes a confidentiality provision (subject to several express carve-outs) wherein the Receiving Party (the Company or a Participant) must hold in confidence information received from a Disclosing Party (the Company or any other Participant); and the Receiving Party may only disclose such information if prior written approval from the Disclosing Party is obtained.⁵²⁹ The confidentiality provision applies to information that is disclosed in connection

⁵²⁵ Id. at Article IX.

⁵²⁶ 17 CFR 240.17a-1. Upon request, representative copies of books and records maintained under Rule 17a-1 must be furnished to the Commission. 17 CFR 240.17a-1(c); see also CAT NMS Plan, supra note 5, at Section 9.1.

⁵²⁷ See CAT NMS Plan, supra note 5, at Section 9.1.

⁵²⁸ Id.

⁵²⁹ Id. at Section 9.6. The CAT NMS Plan states that the information is disclosed by or on behalf of the Company or a Participant (the "Disclosing Party") to the Company or any other Participant (the "Receiving Party") in connection with the Agreement or the CAT System, but excludes any CAT Data or information otherwise disclosed pursuant to the requirements of Rule 613. See CAT NMS Plan, supra note 5, at Section 9.6(a).

with the CAT NMS Plan or the CAT System but expressly carves out the following: (i) CAT Data or information otherwise disclosed pursuant to the requirements of Rule 613⁵³⁰; (ii) any information that was already lawfully in the Receiving Party's possession and, to the knowledge of the Receiving Party, free from any confidentiality obligation to the Disclosing Party at the time of receipt from the Disclosing Party; (iii) any information that is, now or in the future, public knowledge; (iv) any information that was lawfully obtained from a third party having the right to disclose it free from any obligation of confidentiality; or (v) any information that was independently developed by the Receiving Party prior to disclosure by a Disclosing Party.⁵³¹ Finally, the CAT NMS Plan provides that the confidentiality provision does not restrict disclosures required by: (i) applicable laws and regulations, stock market or exchange requirements or the rules of any self-regulatory organization having jurisdiction; (ii) an order, subpoena or legal process; or (iii) for the conduct of any litigation or arbitral proceeding among the Participants (and their respective representatives) and/or the Company.⁵³²

The CAT NMS Plan includes provisions relating to the dissolution of the Company.⁵³³ Any dissolution of the Company requires SEC approval and must be as a result of one of the following events (a "Triggering Event"): (i) unanimous written consent of the Participants; (ii) an event makes it unlawful or impossible for the Company business to be continued; (iii) the termination of one or more Participants such that there is only one remaining Participant; or

⁵³⁰ 17 CFR 242.613.

⁵³¹ See CAT NMS Plan, supra note 5, at Section 9.6(a).

⁵³² Id.

⁵³³ Id. at Article X.

(iv) a decree of judicial dissolution.⁵³⁴ If a Triggering Event has occurred and the SEC approves the Company's dissolution, the Operating Committee would act as liquidating trustee and liquidate and distribute the Company pursuant to the following necessary steps under the CAT NMS Plan: (i) sell the Company's assets; and (ii) apply and distribute the sale proceeds by first, paying the Company's debts and liabilities; second, establishing reasonably necessary reserves for contingent recourse liabilities and obligations; and third, making a distribution to the Participants in proportion to the balances in their positive Capital Accounts.⁵³⁵

25. Security of Data

The CAT NMS Plan provides that the Plan Processor is responsible for the security and confidentiality of all CAT Data received and reported to the Central Repository, including during all communications between CAT Reporters and the Plan Processor, data extraction, data manipulation and transformation, loading to and from the Central Repository, and data maintenance by the Central Repository.⁵³⁶ The Plan Processor must, among other things, require that individuals with access to the Central Repository agree to use CAT Data only for appropriate surveillance and regulatory activities and to employ safeguards to protect the confidentiality of CAT Data.⁵³⁷

In addition, the Plan Processor must develop a comprehensive information security program as well as a training program that addresses the security and confidentiality of all information accessible from the CAT and the operational risks associated with accessing the

⁵³⁴ Id. at Section 10.1.

⁵³⁵ Id. at Section 10.2.

⁵³⁶ See CAT NMS Plan, supra note 5, at Section 6.5(f)(i), (iv)(A).

⁵³⁷ Id. at Section 6.5(f)(i)(A).

Central Repository.⁵³⁸ The Plan Processor must also designate one of its employees as CISO; among other things, the CISO is responsible for creating and enforcing appropriate policies, procedures, and control structures regarding data security.⁵³⁹ The Technical Specifications, which the Plan Processor must publish, must include a detailed description of the data security standards for CAT.⁵⁴⁰ Appendix D of the CAT NMS Plan sets forth minimum data security requirements for CAT that the Plan Processor must meet.⁵⁴¹

a. General Standards

The CAT NMS Plan provides that the data security standards of the CAT System shall, at a minimum satisfy all applicable regulations regarding database security, including provisions of Reg SCI.⁵⁴² Appendix D of the CAT NMS Plan contains a partial list of industry standards to which the Plan Processor will adhere, including standards issued by the NIST⁵⁴³; by the Federal

⁵³⁸ Id. at Sections 6.1(m), 6.12.

⁵³⁹ Id. at Section 6.2(b)(i), (v).

⁵⁴⁰ Id. at Section 6.9(b)(xi).

⁵⁴¹ Id. at Appendix D, Section 4.

⁵⁴² 17 CFR 242.1000–1007; see also CAT NMS Plan, supra note 5, at Section 6.9(b)(xi).

⁵⁴³ Standards issued by NIST that are explicitly listed in the CAT NMS Plan include NIST Security and Privacy Controls for Federal Information Systems and Organizations (Special Publication 800-53 Rev. 4); NIST Contingency Planning Guide for Federal Information Systems (Special Publication 800-34 Rev. 1), particularly Chapters 3, 4 & 5; NIST Guidelines to Federal Organizations on Security Assurance and Acquisition/Use of Test/Evaluated Products (Special Publication 800-23); NIST Technical Guide to Information Security Testing and Assessment (Special Publication 800-115); NIST Guide to Enterprise Password Management (Special Publication 800-118); NIST Recommendation for Cryptographic Key Generation (Special Publication 800-133); and NIST Information Security Continuous Monitoring for Federal Information Systems and Organizations (Special Publication 800-137). See CAT NMS Plan, supra note 5, at Appendix D, Sections 4.2, 5.2 and 5.3.

Financial Institutions Examination Council,⁵⁴⁴ and the International Organization for Standardization.⁵⁴⁵

The CAT NMS Plan specifies that the Plan Processor is responsible for the security and confidentiality of all CAT Data received and reported to the Central Repository, including during all communications between CAT Reporters and the Plan Processor, data extraction, data manipulation and transformation, loading to and from the Central Repository, and data maintenance by the Central Repository.⁵⁴⁶ The Plan Processor must also designate one of its employees as the CISO; among other things, the CISO is responsible for creating and enforcing appropriate policies, procedures, and control structures regarding data security.⁵⁴⁷

b. Data Confidentiality

The CAT NMS Plan also requires that the Plan Processor must develop a comprehensive information security program, with a dedicated staff for the Central Repository, that employs state of the art technology, which program will be regularly reviewed by the CCO and CISO, as well as a training program that addresses the security and confidentiality of all information

⁵⁴⁴ Standards issued by the Federal Financial Institutions Examination Council that are explicitly listed in the CAT NMS Plan include FFIEC Authentication Best Practices, and the Federal Financial Institutions Examination Council, Supplement to Authentication in an Internet Banking Environment (June 22, 2011). See CAT NMS Plan, supra note 5, at Appendix D, Sections 4.1.1, 4.2.

⁵⁴⁵ Standards issued by the International Organization for Standardization that are explicitly listed in the CAT NMS Plan include ISO/IEC 27001—Information Security Management. See CAT NMS Plan, supra note 5, at Appendix D, Section 4.2. The CAT NMS Plan also states that the CAT System must adhere to the 2003 Interagency White Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System, Securities Exchange Act Release No. 47638 (April 8, 2003), 68 FR 17809 (April 11, 2003). See CAT NMS Plan, supra note 5, at Appendix D, Section 5.3.

⁵⁴⁶ See CAT NMS Plan, supra note 5, at Section 6.5(f)(i), (iv)(A).

⁵⁴⁷ Id. at Section 6.2(b)(i), (v).

accessible from the CAT and the operational risks associated with accessing the Central Repository.⁵⁴⁸ The Plan Processor must also implement and maintain a mechanism to confirm the identity of all individuals permitted to access the CAT Data stored in the Central Repository; maintain a record of all instances where such CAT Data was accessed; and implement and maintain appropriate policies regarding limitations on trading activities of its employees and independent contractors involved with all CAT Data.⁵⁴⁹ The Technical Specifications, which will be published after the Plan Processor is selected, must include a detailed description of the data security standards for the CAT.⁵⁵⁰

According to the CAT NMS Plan, the Plan Processor must require that individuals with access to the Central Repository (including the respective employees and consultants of the Participants and the Plan Processor, but excluding employees and Commissioners of the SEC) to agree: (i) to use appropriate safeguards to ensure the confidentiality of the CAT Data stored in the Central Repository and (ii) to not use CAT Data stored in the Central Repository for purposes other than surveillance and regulation in accordance with such individual's employment duties.⁵⁵¹ A Participant, however, is permitted to use the CAT Data it reports to the Central Repository for regulatory, surveillance, commercial or other purposes as permitted by applicable law, rule, or regulation.⁵⁵² In addition, the CAT NMS Plan provides that all individuals with access to the Central Repository (including the respective employees and consultants of the

⁵⁴⁸ Id. at Sections 6.1(m), 6.5(f)(i)(C).

⁵⁴⁹ Id. at Section 6.5(f)(i)(D), (E).

⁵⁵⁰ Id. at Section 6.9.

⁵⁵¹ Id. at Section 6.5(f)(i)(A).

⁵⁵² Id.

Participants and the Plan Processor, but excluding employees and Commissioners of the SEC) must execute a personal “Safeguard of Information Affidavit” in a form approved by the Operating Committee providing for personal liability for misuse of data.⁵⁵³

c. Data Security

Appendix D of the CAT NMS Plan sets forth minimum data security requirements for CAT that the Plan Processor must meet, including various connectivity, data transfer, and encryption requirements.⁵⁵⁴

Appendix D states that the CAT Systems must have encrypted internet connectivity, and that CAT Reporters must connect to the CAT infrastructure using secure methods such as private lines or, for smaller broker-dealers, Virtual Private Network connections over public lines.⁵⁵⁵ Remote access to the Central Repository must be limited to authorized Plan Processor Staff and must use secure “Multi-factor Authentication” (or “MFA”) that meets or exceeds Federal Financial Institutions Examination Council security guidelines surrounding authentication best practices.⁵⁵⁶ Appendix D also notes that CAT databases must be deployed within the network infrastructure so that they are not directly accessible from external end-user networks.⁵⁵⁷ If

⁵⁵³ Id. at Section 6.5(f)(i)(B).

⁵⁵⁴ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.

⁵⁵⁵ Id. at Appendix D, Section 4.1.1.

⁵⁵⁶ Id. Multi-factor authentication, or MFA, is a method requiring a person to provide more than one factor (e.g., biometrics/personal information in addition to a password) in order to be validated by the system.). See id. at Appendix C, Section D.12(e), n.250.

⁵⁵⁷ See id. at Appendix D, Section 4.1.1.

public cloud infrastructures are used, Appendix D states that network segments or private tenant segmentation must be used to isolate CAT Data from unauthenticated public access.⁵⁵⁸

Regarding data encryption, Appendix D states that all CAT Data must be encrypted in-flight using industry standard best practices (e.g., SSL/TLS).⁵⁵⁹ Appendix D provides that symmetric key encryption must use a minimum key size of 128 bits or greater (e.g., AES-128), though larger keys are preferable.⁵⁶⁰ Asymmetric key encryption (e.g., PGP) for exchanging data between Data Submitters and the Central Repository is desirable.⁵⁶¹

Appendix D further states that CAT Data stored in a public cloud must be encrypted at-rest.⁵⁶² Non-personally identifiable information in CAT Data stored in a Plan Processor private environment is not required to be encrypted at-rest.⁵⁶³ If public cloud managed services are used that would inherently have access to the data (e.g., BigQuery, S3, Redshift), then the key management surrounding the encryption of that data must be documented (particularly whether the cloud provider manages the keys, or if the Plan Processor maintains that control).⁵⁶⁴ Auditing and real-time monitoring of the service for when cloud provider personnel are able to access/decrypt CAT Data must be documented, as well as a response plan to address instances

558 Id.

559 Id. at Appendix D, Section 4.1.2.

560 Id.

561 Id.

562 Id.

563 Id.

564 Id.

where unauthorized access to CAT Data is detected.⁵⁶⁵ Key management/rotation/revocation strategies and key chain of custody must also be documented in detail.⁵⁶⁶

Regarding CAT Data storage, the CAT NMS Plan states that data centers housing CAT Systems (whether public or private) must, at a minimum, be SOC 2 certified by an independent third-party auditor.⁵⁶⁷ The frequency of the audit must be at least once per year.⁵⁶⁸ Furthermore, CAT computer infrastructure may not be commingled with other non-regulatory systems (or tenets, in the case of public cloud infrastructure).⁵⁶⁹ Systems hosting the CAT processing for any applications must be segmented from other systems as far as is feasible on a network level (firewalls, security groups, ACL's, VLAN's, authentication proxies/bastion hosts and similar).⁵⁷⁰ In the case of systems using inherently shared infrastructure/storage (e.g., public cloud storage services), an encryption/key management/access control strategy that effectively renders the data private must be documented.⁵⁷¹

Appendix D further requires that the Plan Processor must include penetration testing and an application security code audit by a reputable (and named) third party prior to the launch of CAT as well as periodically as defined in the SLAs.⁵⁷² Reports of the audit will be provided to

⁵⁶⁵ Id.

⁵⁶⁶ Id.

⁵⁶⁷ Id. at Appendix D, Section 4.1.3.

⁵⁶⁸ Id.

⁵⁶⁹ Id.

⁵⁷⁰ Id.

⁵⁷¹ Id.

⁵⁷² Id.

the Operating Committee as well as a remediation plan for identified issues.⁵⁷³ The penetration test reviews of the Central Repository’s network, firewalls, and development, testing and production systems should help the CAT evaluate the systems’ security and resiliency in the face of attempted and successful systems intrusions.⁵⁷⁴

The CAT NMS Plan also addresses issues surrounding access to CAT Data. Among other things, the CAT NMS Plan requires the Plan Processor to provide an overview of how access to PII and other CAT Data by Plan Processor employees and administrators is restricted.⁵⁷⁵ This overview must include items such as, but not limited to, how the Plan Processor will manage access to the systems, internal segmentation, MFA, separation of duties, entitlement management, and background checks.⁵⁷⁶ The Plan Processor must develop and maintain policies and procedures reasonably designed to prevent, detect, and mitigate the impact of unauthorized access or usage of data in the Central Repository.⁵⁷⁷ The CAT NMS Plan also specifically states that a Role Based Access Control (“RBAC”) model must be used to permission users with access to different areas of the CAT System.⁵⁷⁸ The Plan Processor must log every instance of access to Central Repository data by users.⁵⁷⁹ The CAT NMS Plan also has specific provisions related to passwords and logins, particularly as these relate to accessing PII in

⁵⁷³ Id.

⁵⁷⁴ Id.

⁵⁷⁵ Id. at Appendix D, Section 4.1.4.

⁵⁷⁶ Id.

⁵⁷⁷ Id.

⁵⁷⁸ Id.

⁵⁷⁹ Id.

the Central Repository.⁵⁸⁰ Any login to the system that is able to access PII data must follow non-PII password rules and must be further secured via MFA.⁵⁸¹

Appendix D also addresses what should be done in the event there is a breach in the security systems protecting CAT Data. Appendix D requires the Plan Processor to develop policies and procedures governing its responses to systems or data breaches.⁵⁸² Such policies and procedures will include a formal cyber incident response plan, and documentation of all information relevant to breaches.⁵⁸³ The cyber incident response plan will provide guidance and direction during security incidents, and the plan will be subject to approval by the Operating Committee.⁵⁸⁴

d. Data Access and Use

The CAT NMS Plan states that the Plan Processor shall provide Participants and the Commission with access to and use of the CAT Data stored in the Central Repository solely for the purpose of performing their respective regulatory and oversight responsibilities pursuant to federal securities laws, rules and regulations or any contractual obligations.⁵⁸⁵ The Plan specifies that Participants shall establish, maintain and enforce written policies and procedures reasonably designed to ensure the confidentiality of the CAT Data obtained from the Central Repository and limit the use of CAT Data obtained from the Central Repository to surveillance

580 See id.

581 Id.

582 Id. at Appendix D, Section 4.1.5.

583 Id.

584 Id.

585 See id. at Section 6.5(c)(i).

and regulatory purposes.⁵⁸⁶ The CAT NMS Plan provides that Participants must adopt and enforce policies and procedures that implement effective information barriers between each Participant’s regulatory and non-regulatory Staff with regard to CAT Data, permit only persons designated by Participants to have access to the CAT Data stored in the Central Repository; and impose penalties for Staff non-compliance with any of its or the Plan Processor’s policies and procedures with respect to information security.⁵⁸⁷ However, the Plan provides that a Participant may use the Raw Data⁵⁸⁸ it reports to the Central Repository for “commercial or other” purposes if not prohibited by applicable law, rule or regulation.⁵⁸⁹

Article VI of the CAT NMS Plan requires that the Plan Processor provide regulators access to the Central Repository for regulatory and oversight purposes and create a method of accessing CAT Data that includes the ability to run complex searches and generate reports.⁵⁹⁰ Section 6.10(c) of the CAT NMS Plan requires regulator access by two different methods: (i) an online targeted query tool with predefined selection criteria to choose from; and (ii) user-defined direct queries and bulk extractions of data via a query tool or language allowing querying of all

⁵⁸⁶ Id. at Section 6.5(g). The Commission notes that regulatory purposes includes, among other things, analysis and reconstruction of market events, market analysis and research to inform policy decisions, market surveillance, examinations, investigations, and other enforcement functions. See Notice, supra note 5, at 30649 n.266.

⁵⁸⁷ See CAT NMS Plan, supra note 5, at Section 6.5(f)(ii).

⁵⁸⁸ Raw Data is defined as “Participant Data and Industry Member Data that has not been through any validation or otherwise checked by the CAT System.” Id. at Section 1.1.

⁵⁸⁹ Id. at Section 6.5(h).

⁵⁹⁰ Id. at Section 6.5(c)(i), (ii). Appendix C provides objective milestones to assess progress concerning regulator access to the Central Repository. See id. at Appendix C, Section C.10(d).

available attributes and data sources.⁵⁹¹ Appendix D contains technical details and parameters for use by the Plan Processor in developing the systems that will allow regulators access to CAT Data.⁵⁹²

Appendix C addresses the time and method by which CAT Data would be available to regulators.⁵⁹³ Specifically, Appendix C requires that data be available to regulators any point after the data enters the Central Repository and passes basic format validations.⁵⁹⁴ After errors are communicated to CAT Reporters on a T+1 basis, CAT Reporters would be required to report corrected data back to the Central Repository by 8:00 a.m. ET on T+3.⁵⁹⁵ Regulators must then have access to corrected and linked order and Customer data by 8:00 a.m. ET on T+5.⁵⁹⁶ Appendix C further outlines requirements the Plan Processor must meet for report building and analysis regarding data usage by regulators, consistent with, and in addition to, the specifications outlined in Appendix D.⁵⁹⁷

e. Personally Identifiable Information

According to the CAT NMS Plan, there are two separate categories of CAT Data for data

⁵⁹¹ Id. at Section 6.10(c)(i). Section 6.10(c) also requires the Plan Processor to reasonably assist regulatory Staff with queries, submit queries on behalf of regulatory Staff as requested, and maintain a help desk to assist regulatory Staff with questions concerning CAT Data. Id. at 6.10(c)(iv)–(vi).

⁵⁹² See id. at Appendix D, Section 8.

⁵⁹³ Id. at Appendix C, Section A.2.

⁵⁹⁴ Id. at Appendix C, Section A.2(a). Appendix C, Section A.3(e) indicates this would be no later than noon EST on T+1. Id. at Appendix C, Section A.3(e).

⁵⁹⁵ Id. at Appendix C, Section A.1(a)(iv); Appendix D, Section 6.1.

⁵⁹⁶ Id. at Appendix C, Section A.2(a).

⁵⁹⁷ Id. at Appendix C, Section A.2(c). Appendix C, Section A.2(d) addresses system service level agreements that the SROs and Plan Processor would enter into. See id. at Appendix C, Section A.2(d).

security and confidentiality purposes: (i) PII; and (ii) other data related to orders and trades reported to the CAT.⁵⁹⁸ The Plan requires additional levels of protection for PII that is collected from Customers and reported to the Central Repository.⁵⁹⁹ For example, the CAT NMS Plan requires that all CAT Data provided to regulators must be encrypted, but that PII data shall be masked unless users have permission to view the CAT Data that has been requested.⁶⁰⁰ The Plan requires that all PII data must be encrypted both at-rest and in-flight, including archival data storage methods such as tape backup.⁶⁰¹ Storage of unencrypted PII data is prohibited.⁶⁰² The Plan Processor must describe how PII encryption is performed and the key management strategy (e.g., AES-256, 3DES).⁶⁰³

An additional protection afforded to PII concerns specific requirements for access. The CAT NMS Plan specifies that by default, users entitled to query CAT Data are not automatically authorized for PII access, and that the process by which a person becomes entitled for PII access, and how they then go about accessing PII data, must be documented by the Plan Processor.⁶⁰⁴ Access to PII will be based on a Role Based Access Control (“RBAC”) model, and shall follow the “least privileged” practice of limiting access as much as possible.⁶⁰⁵ In this regard, the CAT NMS Plan states that access will be limited to a “need-to-know” basis, and it is expected that the

⁵⁹⁸ See id. at Appendix C, Section A.4.

⁵⁹⁹ See id. at Appendix C, Section A.4(a).

⁶⁰⁰ See id. at Section 6.10(c)(ii).

⁶⁰¹ Id. at Appendix D, Section 4.1.2

⁶⁰² Id.

⁶⁰³ Id.

⁶⁰⁴ Id. at Appendix D, Section 4.1.6.

⁶⁰⁵ Id.

number of people given access to PII associated with Customers and accounts will be much lower than the number granted access to non-PII CAT Data.⁶⁰⁶ The CAT NMS Plan further specifies that any login system that is able to access PII must follow non-PII password rules and must be further secured via MFA.⁶⁰⁷ MFA authentication for all logins (including non-PII) is required to be implemented by the Plan Processor.⁶⁰⁸

The CAT NMS Plan also requires that a designated officer or employee at each Participant and the Commission, such as the chief regulatory officer, must, at least annually, review and certify that persons with PII access have appropriately been designated to access PII in light of their respective roles.⁶⁰⁹ The CAT NMS Plan requires that a full audit trail of access to the PII collected at the Central Repository—which would include who accessed what data and when—must be maintained, and that the CCO and CISO shall have access to daily PII reports that list all users who are entitled for PII access, as well as the audit trail of all PII access that has occurred for the day being reported on.⁶¹⁰

The CAT NMS Plan also restricts the circumstances under which PII can be provided to an authorized person. The CAT NMS Plan provides, for example, that PII must not be included in the result set(s) from online or direct query tools, reports or bulk data extraction.⁶¹¹ Instead,

⁶⁰⁶ Id. at Appendix C, Section A.4.

⁶⁰⁷ Id. at Appendix D, Section 4.1.4. MFA is a method requiring a person to provide more than one factor (e.g., biometrics/personal information in addition to a password) in order to be validated by the system. See CAT NMS Plan, supra note 5, at Appendix C, Section D.12(e), n.250.

⁶⁰⁸ See id. at Appendix D, Section 4.1.4.

⁶⁰⁹ Id. at Appendix D, Section 4.1.6.

⁶¹⁰ Id.

⁶¹¹ Id.

the CAT NMS Plan requires any such results, reports or extractions to be displayed with “non-PII unique identifiers (e.g., Customer-ID or Firm Designated ID).”⁶¹² The CAT NMS Plan states that the PII corresponding to these non-PII identifiers can be gathered by using a separate “PII workflow.”⁶¹³

Finally, the CAT NMS Plan further protects PII by requiring that PII data be stored separately from other CAT Data.⁶¹⁴ The Plan specifies that PII cannot be stored with the transactional CAT Data, and it must not be accessible from public internet connectivity.⁶¹⁵

26. Governing or Constituent Documents

Rule 608 requires copies of all governing or constituent documents relating to any person (other than a self-regulatory organization) authorized to implement or administer such plan on behalf of its sponsors.⁶¹⁶ The Participants will submit to the Commission such documents related to the Plan Processor when the Plan Processor is selected.⁶¹⁷

27. Development and Implementation Phases

The terms of the Plan will be effective immediately upon approval of the Plan by the Commission (the “Effective Date”).⁶¹⁸ The Plan sets forth each of the significant phases of development and implementation contemplated by the Plan, together with the projected date of

⁶¹² Id.

⁶¹³ Id.

⁶¹⁴ Id.

⁶¹⁵ Id.

⁶¹⁶ 17 CFR 242.608(a)(4)(i).

⁶¹⁷ See CAT NMS Plan, supra note 5, at Section 6.7(a)(i).

⁶¹⁸ Effective Date is defined as “the date of approval of [the CAT NMS Plan] by the Commission.” Id. at Section 1.1.

completion of each phase.⁶¹⁹ These include the following, each of which is subject to orders otherwise by the Commission:

Within two months after the Effective Date, the Participants will jointly select the winning Shortlisted Bid and the Plan Processor pursuant to the process set forth in Article V. Following the selection of the Initial Plan Processor, the Participants will file with the Commission a statement identifying the Plan Processor and including the information required by Rule 608;

Within four months after the Effective Date, each Participant will, and, through its Compliance Rule, will require its Industry Members to, synchronize its or their Business Clocks and certify to the Chief Compliance Officer (in the case of Participants) or the applicable Participant (in the case of Industry Members) that it has met this requirement;

Within six months after the Effective Date, the Participants must jointly provide to the SEC a document outlining how the Participants could incorporate into the CAT information with respect to equity securities that are not NMS Securities,⁶²⁰ including Primary Market Transactions in securities that are not NMS Securities, which document will include details for each order and Reportable Event that may be required to be provided, which market participants may be required to provide the data, the implementation timeline, and a cost estimate;

Within one year after the Effective Date, each Participant must report Participant Data to the Central Repository;

Within fourteen months after the Effective Date, each Participant must implement a new or enhanced surveillance system(s);

Within two years after the Effective Date, each Participant must, through its Compliance Rule, require its Industry Members (other than Small Industry Members) to report Industry Member Data to the Central Repository; and

Within three years after the Effective Date, each Participant must, through its Compliance Rule, require its Small Industry Members to provide Industry Member Data to the Central Repository.⁶²¹

⁶¹⁹ Id. at Section 6.7, Appendix C, Section C.10.

⁶²⁰ See id. at Section 6.7(a). In the Amendment to the CAT NMS Plan, Section 6.11 excludes OTC Equity Securities from the document the Participants would submit to the Commission, since the Participants plan to include OTC Equity Securities as well as NMS Securities in the initial phase in of CAT. See Notice, supra note 5, at 30634 n.82.

⁶²¹ See CAT NMS Plan, supra note 5, at Section 6.7(a).

In addition, Industry Members and Participants will be required to participate in industry testing with the Central Repository on a schedule to be determined by the Operating Committee.

Furthermore, Appendix C, A Plan to Eliminate Existing Rules and Systems (Rule 613(a)(1)(ix)), and Appendix D, Data Types and Sources, set forth additional implementation details concerning the elimination of rules and systems.

The CCO will appropriately document objective milestones to assess progress toward the implementation of the CAT.⁶²²

As required by Rule 613(a)(1)(x),⁶²³ the CAT NMS Plan also sets forth detailed objective milestones, with projected completion dates, towards CAT implementation.⁶²⁴ The milestones discussed in the Plan include timeframes for when the Plan Processor will publish Technical Specifications for Participants and Industry Members to report order and market maker quote data and Customer Account Information⁶²⁵ to the Central Repository, as well as timeframes for

⁶²² See *id.* at Section 6.7(b).

⁶²³ 17 CFR 242.613(a)(1)(x).

⁶²⁴ See CAT NMS Plan, *supra* note 5, at Appendix C, Section C.10. The CAT NMS Plan requires the CCO to document these objective milestones to assess progress toward the implementation of CAT. See *id.* at Section 6.7(b).

⁶²⁵ “Customer Account Information” shall include, but not be limited to, account number, account type, customer type, date account opened, and large trader identifier (if applicable); except, however, that (a) in those circumstances in which an Industry Member has established a trading relationship with an institution but has not established an account with that institution, the Industry Member will (i) provide the Account Effective Date in lieu of the “date account opened”; (ii) provide the relationship identifier in lieu of the “account number”; and (iii) identify the “account type” as a “relationship”; (b) in those circumstances in which the relevant account was established prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter (as set forth in Rule 613(a)(3)(v) and (vi)), and no “date account opened” is available for the account, the Industry Member will provide the Account Effective Date in the following circumstances: (i) where an Industry Member changes back office providers or clearing firms and the date account opened is changed to the date the account was opened on the

connectivity and acceptance testing for the reporting of this information.⁶²⁶ For example, the Plan Processor will publish Technical Specifications for Industry Member submission of order data one year before Industry Members are required to begin submitting this data to the Central Repository, and the Plan Processor will begin connectivity testing and accepting order data from Industry Members for testing purposes six months before Industry Members are required to begin submitting this data to the Central Repository.⁶²⁷ The Plan Processor will begin connectivity testing and accepting order and market maker quote data from Participants for testing purposes three months before Participants are required to begin reporting this data to the Central Repository and will publish Technical Specifications for Participant submission of this data six months before Participants are required to submit this data to the Central Repository.⁶²⁸ The CAT NMS Plan also includes implementation timeframes for the linkage of the lifecycle of order events, regulator access to the Central Repository, and the integration of other data (such as SIP quote and trade data) into the Central Repository.⁶²⁹

new back office/clearing firm system; (ii) where an Industry Member acquires another Industry Member and the date account opened is changed to the date the account was opened on the post-merger back office/clearing firm system; (iii) where there are multiple dates associated with an account in an Industry Member's system, and the parameters of each date are determined by the individual Industry Member; and (iv) where the relevant account is an Industry Member proprietary account.” See id. at Section 1.1.

⁶²⁶ See id. at Appendix C, Section C.10(a)–(b).

⁶²⁷ See id. at Appendix C, Section C.10(b).

⁶²⁸ See id.

⁶²⁹ See id. at Appendix C, Section C.10(c)–(e).

28. Written Understanding or Agreements Relating to Interpretation of, or Participation in, the Plan

The Participants have no written understandings or agreements relating to interpretations of, or participation in, the Plan other than those set forth in the Plan itself.⁶³⁰ For example, Section 4.3(a)(iii) states that the Operating Committee only may authorize the interpretation of the Plan by Majority Vote, Section 6.9(c)(i) addresses interpretations of the Technical Specifications, and Section 8.2 addresses the interpretation of Sections 8.1 and 8.2.⁶³¹ In addition, Section 3.3 sets forth how any entity registered as a national securities exchange or national securities association under the Exchange Act may become a Participant.⁶³²

29. Dispute Resolution

The Plan does not include a general provision addressing the method by which disputes arising in connection with the operation of the Plan will be resolved.⁶³³ The Plan does, however, provide the means for resolving disputes regarding the Participation Fee.⁶³⁴ Specifically, Article III states that, in the event that the Company and a prospective Participant do not agree on the amount of the Participation Fee, such amount will be subject to the review by the Commission pursuant to Section 11A(b)(5) of the Exchange Act.⁶³⁵ In addition, the Plan addresses disputes with respect to fees charged to Participants and Industry Members pursuant to Article XI. Specifically, such disputes will be determined by the Operating Committee or a

⁶³⁰ See Notice, supra note 5, at 30635.

⁶³¹ See CAT NMS Plan, supra note 5, at Sections 4.3(a)(iii), 6.9(c)(i), 8.2.

⁶³² See id. at Section 3.3.

⁶³³ See Notice, supra note 5, at 30635.

⁶³⁴ See CAT NMS Plan, supra note 5, at Section 3.3(b).

⁶³⁵ See id.; see also 15 U.S.C. 78k-l(b)(5).

Subcommittee designated by the Operating Committee.⁶³⁶ Decisions by the Operating Committee or such designated Subcommittee on such matters will be binding on Participants and Industry Members, without prejudice to the rights of any Participant or Industry Member to seek redress from the Commission pursuant to Rule 608 or in any other appropriate forum.⁶³⁷

IV. Discussion and Commission Findings

In 1975, Congress directed the Commission, through the enactment of Section 11A of the Act,⁶³⁸ to facilitate the establishment of a national market system. Section 11A(a)(3)(B) of the Act authorizes the Commission, “by rule or order, to authorize or require self-regulatory organizations to act jointly with respect to matters as to which they share authority under this title in planning, developing, operating, or regulating a national market system (or a subsystem thereof) or one or more facilities.”⁶³⁹ The Commission adopted Rule 613 of Regulation NMS under the Act,⁶⁴⁰ requiring the SROs to submit an NMS plan to create, implement, and maintain the CAT.⁶⁴¹

Rule 613 tasks the Participants with the responsibility to develop a CAT NMS Plan that achieves the goals set forth by the Commission. Because the Participants will be more directly responsible for the implementation of the CAT NMS Plan, in the Commission’s view, it is appropriate that they make the judgment as to how to obtain the benefits of a consolidated audit trail in a way that is practicable and cost-effective in the first instance. The Commission’s

⁶³⁶ See CAT NMS Plan, supra note 5, at Section 11.5.

⁶³⁷ Id.

⁶³⁸ 15 U.S.C. 78k-1.

⁶³⁹ 15 U.S.C. 78k-1(a)(3)(B).

⁶⁴⁰ See Adopting Release, supra note 14; see also Proposing Release, supra note 14.

⁶⁴¹ 17 CFR 242.613(a)(1), (c)(1), (c)(7).

review of an NMS plan is governed by Rule 608 and, under that rule, approval is conditioned upon a finding that the proposed plan is “necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanism of, a national market system, or otherwise in furtherance of the purposes of the Act.”⁶⁴² Further, Rule 608 provides the Commission with the authority to approve an NMS plan, “with such changes or subject to such conditions as the Commission may deem necessary or appropriate.”⁶⁴³ In reviewing the policy choices made by the Participants in developing the CAT NMS Plan, the Commission has sought to ensure that they are supported by an adequate rationale, do not call into question the Plan’s satisfaction of the approval standard in Rule 608, and reasonably achieve the benefits of a consolidated audit trail without imposing unnecessary burdens. In addition, because of the evolving nature of the data captured by the CAT and the technology used, as well as the number of decisions still to be made in the process of implementing the CAT NMS Plan, the Commission has paid particular attention to the structures in place to guide decision-making going forward. These include the governance of the Company, the provisions made for Commission and other oversight, the standards established, and the development milestones provided for in the Plan.

The Commission received 24 comment letters on the CAT NMS Plan.⁶⁴⁴ The commenters included, among others, national securities exchanges, technology providers, academics, broker-dealers, investors, and organizations representing industry participants. Of

⁶⁴² 17 CFR 242.608(b)(2); see also 15 U.S.C. 78k-1(a).

⁶⁴³ 17 CFR 242.608(b)(2).

⁶⁴⁴ See supra note 6.

the comment letters received regarding the Plan, 13 expressed general support,⁶⁴⁵ 3 comment letters expressed opposition to the Plan,⁶⁴⁶ and 8 comment letters neither supported nor opposed the Plan.⁶⁴⁷ Many of the commenters suggested modifications to certain provisions of the Plan or identified what they believed were deficiencies in the Plan.

The most significant areas raised in the comment letters pertained to: (i) the security and confidentiality of CAT Data (especially of PII); (ii) the cost and funding of the CAT; (iii) the timing of the retirement of duplicative regulatory reporting systems; (iv) the implementation time frame; (v) governance (particularly with respect to industry representation); (vi) the clock synchronization standard; (vii) error rates; and (viii) an overall lack of detail in the CAT NMS Plan.

As discussed in detail below, the Commission has determined to approve the CAT NMS Plan, as amended, pursuant to Section 11A of the Act⁶⁴⁸ and Rule 608.⁶⁴⁹ The Commission believes that the Plan is reasonably designed to improve the completeness, accuracy, accessibility and timeliness of order and execution data used by regulators. The Commission believes that the Plan will facilitate regulators' access to more complete, accurate and timely audit trail data. The Plan will also allow for more efficient and effective surveillance and analysis, which will better enable regulators to detect misconduct, reconstruct market events, and

⁶⁴⁵ FSR, FSI, MFA, ICI, TR, SIFMA, FIF, Fidelity, UnaVista, CBOE, KCG, and NYSE Letters.

⁶⁴⁶ Better Markets, Bloomberg, and Data Boiler Letters.

⁶⁴⁷ Anonymous I, Anonymous II, DAG, STA, DTCC, Hanley, Wachtel, FIX Trading, and Garrett Letters.

⁶⁴⁸ 15 U.S.C. 78k-1.

⁶⁴⁹ 17 CFR 242.608(b)(2).

assess potential regulatory changes. As a result, the CAT NMS Plan should significantly improve regulatory efforts by the SROs and the Commission, including market surveillance, market reconstructions, enforcement investigations, and examinations of market participants. The Commission believes that improved regulatory efforts, in turn, will strengthen the integrity and efficiency of the markets, which will enhance investor protection and increase capital formation.

As noted, commenters raised concerns about, and suggested alternatives to, certain Plan provisions. The Participants submitted five letters which responded to the comments and provided certain suggestions for amendments to the Plan, as discussed in detail below. After considering the proposed Plan, the issues raised by commenters, and the Participants' responses, the Commission has amended certain aspects of the Plan and has determined that the proposed Plan, as amended by the Commission, satisfies the standard of Rule 608. The Commission finds that the CAT NMS Plan is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanism of a national market system, or is otherwise in furtherance of the purposes of the Act.⁶⁵⁰ The Commission does not believe that the remaining concerns identified by commenters individually or collectively call into question the Plan's satisfaction of the approval standard in Rule 608, or otherwise warrant a departure from the policy choices made by the Participants.

A. Definitions, Effectiveness of Agreement, and Participation (Articles I, II, and III)

Article I of the CAT NMS Plan sets forth definitions for certain terms used in the CAT NMS Plan, as well as principles of interpretation. Article II of the CAT NMS Plan describes the

⁶⁵⁰ See 17 CFR 242.608(b)(2).

corporate structure under which the Participants will build and maintain the CAT, and Article III addresses participation in the Plan, including admission of new Participants, resignation and termination of Participants, and the obligations and liability of Participants.⁶⁵¹

The Commission did not receive any comments relating to Article II or III of the CAT NMS Plan, and is approving them as proposed, with certain technical conforming changes to reflect the Participants' proposal to treat the Company as a non-profit and certain Exchange Act obligations.⁶⁵² The Commission did receive comments on three definitions⁶⁵³: (1) Allocation Report;⁶⁵⁴ (2) Trading Day;⁶⁵⁵ and (3) Eligible Security.⁶⁵⁶

For the definition of Allocation Report,⁶⁵⁷ one commenter stated that "allocation time is not consistently defined or captured," and that without further guidance, CAT Reporters may

⁶⁵¹ See Section III.1.; Section III.2., supra.

⁶⁵² See Sections IV.B and IV.F, infra.

⁶⁵³ The Commission notes that some commenters recommended changing specific provisions in the CAT NMS Plan, which would also result in modifications to certain definitions set forth in Article I (e.g., Error Rate and Primary Market Transaction). The Commission discusses such comments in the Sections below in conjunction with the relevant substantive CAT NMS Plan provisions.

⁶⁵⁴ TR Letter at 9.

⁶⁵⁵ FIF Letter at 95–96.

⁶⁵⁶ Anonymous Letter I at 9.

⁶⁵⁷ The Plan defines "Allocation Report" to mean a report made to the Central Repository by an Industry Member that identifies the Firm Designated ID for any account(s), including subaccount(s), to which executed shares are allocated and provides the security that has been allocated, the identifier of the firm reporting the allocation, the price per share of shares allocated, the side of shares allocated, the number of shares allocated to each account, and the time of the allocation; provided, for the avoidance of doubt, any such Allocation Report shall not be required to be linked to particular orders or executions. See CAT NMS Plan, supra note 5, at Section 1.1.

have difficulties reporting this data element.⁶⁵⁸ The Participants responded to this comment by explaining that the Participants have not yet determined how “time of the allocation” will be defined, but indicated that they would address this in the Technical Specifications.⁶⁵⁹

For the definition of Trading Day,⁶⁶⁰ one commenter stated that the cut-off time for Trading Day is not defined and argued that, consistent with OATS, the cut-off time should be 4:00 p.m., ET.⁶⁶¹ The commenter argued a later cut-off time would compress the time CAT Reporters have to collect, validate, and report data in a timely manner.⁶⁶² The Participants responded to this comment by explaining that a universal cut-off time for Trading Day is not recommended for the CAT because cut-off times may differ based on the different types of Eligible Securities (including the potential expansion of the security types covered in Eligible Securities). Rather, the Participants stated that the Operating Committee should determine cut-off times for the Trading Day and indicated that they would address this in the Technical Specifications.⁶⁶³

For the definition of Eligible Security,⁶⁶⁴ one commenter stated that “a full audit trail

⁶⁵⁸ TR Letter at 9.

⁶⁵⁹ Response Letter I at 25.

⁶⁶⁰ The Plan states that “Trading Day” shall have such meaning as is determined by the Operating Committee. For the avoidance of doubt, the Operating Committee may establish different Trading Days for NMS Stocks (as defined in SEC Rule 600(b)(47), Listed Options, OTC Equity Securities, and any other securities that are included as Eligible Securities from time to time. See CAT NMS Plan, supra note 5, at Section 1.1.

⁶⁶¹ FIF Letter at 95–96.

⁶⁶² Id. at 96, 124.

⁶⁶³ Response Letter I at 31.

⁶⁶⁴ The CAT NMS Plan provides that “Eligible Security” includes (a) all NMS Securities and (b) all OTC Equity Securities. See CAT NMS Plan, supra note 5, at Section 1.1.

would include transactions both on and off exchange.”⁶⁶⁵ The Participants noted that the CAT will capture on- and off-exchange transactions for NMS Securities and OTC Equity Securities, as the CAT would “capture orders and transactions in NMS Securities and OTC Equity Securities, even if they occur in ATSS/dark pools, other trading venues or internally within broker-dealers.”⁶⁶⁶

The Commission believes that the definitions and principles of interpretation set forth in Article I of the CAT NMS Plan are reasonably designed to provide clarity to the terms set forth in the CAT NMS Plan. In response to the commenters that recommended modifications to the definitions of Allocation Report and Trading Day, the Commission believes it is reasonable for the Participants to address the Allocation Report and Trading Day specifics raised by commenters in the Technical Specifications to provide the CAT with necessary flexibility during its implementation, and based on the Plan’s requirement that the Technical Specifications will be published no later than one year prior to when Industry Member reporting begins.⁶⁶⁷ With respect to Eligible Securities, the Commission believes that the commenter’s concern is addressed already in the Plan.

The Commission also notes that the Participants submitted a letter to the Commission indicating that the names of certain Participants had changed and that two new exchanges have been approved by the Commission.⁶⁶⁸ Specifically, the Participants stated that BATS Exchange, Inc. is now known as Bats BZX Exchange, Inc.; BATS Y-Exchange, Inc. is now known as Bats

⁶⁶⁵ Anonymous Letter I at 9.

⁶⁶⁶ Response Letter I at 25.

⁶⁶⁷ See Section IV.D.8.a, *infra*.

⁶⁶⁸ Participants’ Letter I at 1.

BYX Exchange, Inc.; EDGA Exchange, Inc. is now known as Bats EDGA Exchange, Inc.; EDGX Exchange, Inc. is now known as Bats EDGX Exchange, Inc.; NASDAQ OMX BX, Inc. is now known as NASDAQ BX, Inc.; and NASDAQ OMX PHLX LLC is now known as NASDAQ PHLX LLC.⁶⁶⁹ In addition, the Participants stated that two new exchanges were approved by the Commission: ISE Mercury, LLC and Investors' Exchange, LLC.⁶⁷⁰ Thus, the Participants suggested that the Commission amend the Plan to reflect that ISE Mercury, LLC and Investors' Exchange LLC are Participants to the CAT NMS Plan, and to include their names on the signature block for the CAT NMS Plan (including the Plan's appendices).⁶⁷¹ The Commission believes it is appropriate to amend the CAT NMS Plan to reflect the name changes of certain Participants because this will ensure that the names of those Participants are accurately reflected, and to amend the CAT NMS Plan to add ISE Mercury, LLC and Investors' Exchange, LLC as Participants to the CAT NMS Plan because all SROs are intended to be Participants to the CAT NMS Plan.⁶⁷²

B. Management of the Company (Article IV)

Article IV of the CAT NMS Plan describes the management structure of CAT NMS, LLC.⁶⁷³ Many commenters raised concerns related to the governance structure set forth in the

⁶⁶⁹ Id.

⁶⁷⁰ Id.

⁶⁷¹ Id.

⁶⁷² See Notice, supra note 5, at 30618.

⁶⁷³ See Section III.3, supra.

CAT NMS Plan.⁶⁷⁴ Most of the governance comments focused on the role, composition, obligations and powers of the Operating Committee and the Advisory Committee.⁶⁷⁵ A few commenters identified potential conflicts of interest (both with respect to the Officers and the Participants) as well as other governance concerns, including whether the CAT should be under the Commission's direct and sole control.⁶⁷⁶

1. Operating Committee

Article IV of the CAT NMS Plan provides that an Operating Committee will manage the CAT, where each Participant appoints one member of the Operating Committee, and each Participant appointee has one vote.⁶⁷⁷ Article IV also sets forth certain other provisions relating to the Operating Committee, including identification of those actions requiring a Majority Vote, a Supermajority Vote, or a unanimous vote; and the management of conflicts of interest. Commenters raised concerns about the composition, voting and independence of the Operating Committee.

Some commenters argued that the composition of the Operating Committee should not be limited to the SROs,⁶⁷⁸ arguing that non-SROs also should have full voting powers.⁶⁷⁹

⁶⁷⁴ FSI Letter at 3; MFA Letter at 3–4; ICI Letter at 10–13; TR Letter at 6–7; SIFMA Letter at 24–29; FIF Letter at 14, 135–37; Fidelity Letter at 6–8; Better Markets Letter at 4–6; KCG Letter at 5–7; DAG Letter at 3; NYSE Letter at 4–6; STA Letter at 1–2.

⁶⁷⁵ MFA Letter at 3–4; ICI Letter at 10–13; SIFMA Letter at 24–29; KCG Letter at 5–7; DAG Letter at 3; NYSE Letter at 4–6; TR Letter at 6–7; FIF Letter at 14, 135–37; see also STA Letter at 1 (supporting the DAG Letter's governance recommendations).

⁶⁷⁶ FSI Letter at 3; MFA Letter at 3–4; ICI Letter at 10–13; Better Markets Letter at 4–6.

⁶⁷⁷ See CAT NMS Plan, supra note 5, at Section 4.2, Appendix C, Section D.11(b).

⁶⁷⁸ MFA Letter at 3–4; ICI Letter at 10–13; SIFMA Letter at 24–26; KCG Letter at 5–7; DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter's governance recommendations).

Commenters recommended that the Operating Committee should include members who are broker-dealers,⁶⁸⁰ and other non-SRO and non-broker-dealer market participants,⁶⁸¹ institutional investors, broker-dealers with a substantial retail base, broker-dealers with a substantial institutional base, a data management expert, and a federal agency representative with national security cybersecurity experience.⁶⁸² Another commenter recommended including representatives of registered funds as members of the Operating Committee, noting their strong interest in ensuring the security of CAT Data and that CAT Reporter position information and trading strategies not be compromised.⁶⁸³ Two commenters argued that no legal authority bars broker-dealers or other non-SROs from serving on the Operating Committee.⁶⁸⁴

In support of their recommendation to expand the Operating Committee’s membership, commenters stressed the need for meaningful input by stakeholders with specific expertise, which they believed would improve the implementation and maintenance of the CAT.⁶⁸⁵ One commenter described the CAT as “a uniquely complex facility”⁶⁸⁶ and another commenter described the CAT as “a critical market utility designed to benefit the national market system

⁶⁷⁹ SIFMA Letter at 24–26; KCG Letter at 5–7; DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁶⁸⁰ SIFMA Letter at 25; MFA Letter at 3; DAG Letter at 3; KCG Letter at 6; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁶⁸¹ KCG Letter at 6; MFA Letter at 3.

⁶⁸² MFA Letter at 3.

⁶⁸³ ICI Letter at 11. This commenter further noted that registered funds’ expertise in protecting trade and order information could help formulate CAT-related data security policies. Id.

⁶⁸⁴ KCG Letter at 6; ICI Letter at 11.

⁶⁸⁵ SIFMA Letter at 25; KCG Letter at 7.

⁶⁸⁶ SIFMA Letter at 25.

and all market participants,” and stated that as such “the governance and operation of the CAT NMS Plan should be structured to obtain meaningful input from the broker-dealer community.”⁶⁸⁷ One of these commenters noted broker-dealers would have complementary “expertise and insight” to the SROs, insofar as broker-dealers would be “providing the lion’s share of the reported data to the CAT.”⁶⁸⁸ This commenter clarified that, in recommending broker-dealer participation on the Operating Committee, the commenter “does not expect (or request) that broker-dealer representatives would have access to the surveillance patterns and other regulatory means by which the SROs will use the data collected by the CAT.”⁶⁸⁹

One commenter described the industry’s experience as part of the DAG as informing its belief that full industry participation on the Operating Committee is required.⁶⁹⁰ This commenter stated that “the SROs limited the Industry’s participation in important aspects of the development process” to an extent that direct engagement with Bidders “provided a more complete and relevant picture of the proposed CAT solution than had been received through

⁶⁸⁷ KCG Letter at 7. KCG suggested that the Advisory Committee alone would have “almost no voice in the operation [of the] NMS plan” based on the feedback regarding the administration and operation of other NMS plans. KCG Letter at 7.

⁶⁸⁸ SIFMA Letter at 25; see also ICI Letter at 11 (“The perspective of other market participants—particularly given that the central repository will house their sensitive information—would help in the development and maintenance of the CAT.”); MFA Letter at 3 (“The decisions of the Operating Committee, such as those related to data security... will have a significant impact on market participants immediately and in the future.”). One commenter further noted that “the SROs expect the broker-dealers to help fund the costs of the CAT, and they proposed a funding model under which the vast majority of the CAT building and operating costs would be imposed on the broker-dealer firms.” SIFMA Letter at 25.

⁶⁸⁹ SIFMA Letter at 25.

⁶⁹⁰ DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

involvement in the DAG.”⁶⁹¹ This commenter argued the Operating Committee should include non-SRO industry participants because it would allow them to participate in selecting a Plan Processor and developing the CAT operating procedures.⁶⁹²

One commenter recommended that the allocation of voting rights among the Participants be reevaluated, noting that the Commission’s Equity Market Structure Advisory Committee (“EMSAC”) provided a similar recommendation regarding plan governance generally.⁶⁹³ This commenter also recommended limiting the number of Operating Committee actions that require unanimous voting.⁶⁹⁴

Commenters also recommended that the Operating Committee include “independent directors.”⁶⁹⁵ One commenter recommended that these independent directors be both non-

⁶⁹¹ DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁶⁹² DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁶⁹³ Fidelity Letter at 7. The Commission also notes that although the commenter did not include the EMSAC’s rationale for the reallocation of voting rights recommendation, in the EMSAC Recommendations cited by the commenter, the EMSAC explained that it recommended reallocating voting rights because the “reallocation of voting rights [among NMS plan participants] is intended to better reflect the proportional interests of NMS [p]lan participants”). See EMSAC, Recommendations Regarding Enhanced Industry Participation in Certain SRO Regulatory Matters (June 10, 2016), available at <https://www.sec.gov/spotlight/emsac/emsac-trading-venues-regulation-subcommittee-recomendation-61016.pdf> (“EMSAC Recommendations”).

⁶⁹⁴ Fidelity Letter at 7. This commenter noted that the EMSAC provided this recommendation. The Commission notes that although the commenter did not include the EMSAC’s rationale for this recommendation, in the EMSAC Recommendations cited by the commenter, the EMSAC explained that it recommended the limited use of unanimous voting requirements “to prevent undue friction or delay in [p]lan voting matters.” See EMSAC Recommendations, supra note 693, at 8.

⁶⁹⁵ See Better Markets Letter at 6; DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations); SIFMA Letter at 25 n.4 (noting Rule 613

industry and non-SRO.⁶⁹⁶ Other commenters argued that the “CAT governance structure should include independent directors, comprised of both non-[i]ndustry and [i]ndustry participants.”⁶⁹⁷

In response to comments regarding the composition of the Operating Committee, the Participants argued that the Operating Committee should remain as a committee solely of SROs because only SROs have a statutory obligation under the Exchange Act to create, implement and maintain the CAT and regulate securities markets, whereas broker-dealers do not.⁶⁹⁸ The Participants also identified potential conflicts of interest if the “subjects of surveillance [are] involved in decision-making of a plan that, at its core has SEC and [SRO] regulatory surveillance as its primary objective.”⁶⁹⁹ Finally, the Participants discussed their belief that the Advisory Committee, discussed below, is the appropriate forum for non-Participants to provide their views.⁷⁰⁰

In response to comments regarding the allocation of voting rights among the Participants, the Participants explained that each Participant has one vote to permit equal representation among the Participants.⁷⁰¹ The Participants indicated their commitment to this allocation of voting rights because each Participant independently has obligations with regard to the CAT under Rule 613, and each Participant’s regulatory surveillance obligations are not constrained by

does not preclude the SROs from including independent directors in the Operating Committee).

⁶⁹⁶ Better Markets Letter at 6.

⁶⁹⁷ DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁶⁹⁸ Response Letter I at 6; see also, NYSE Letter at 5.

⁶⁹⁹ Response Letter I at 6.

⁷⁰⁰ Id. at 7.

⁷⁰¹ Id.

revenues or market share. The Participants also noted that this voting model is common among other NMS plans.⁷⁰²

In response to the commenter suggesting that the CAT NMS Plan should limit the number of provisions requiring a unanimous vote, the Participants highlighted that only three extraordinary circumstances require a unanimous vote under the CAT NMS Plan: (i) obligating Participants to make a loan or capital contribution to the Company;⁷⁰³ (ii) dissolving the Company;⁷⁰⁴ and (iii) acting by written consent in lieu of a meeting.⁷⁰⁵

In response to comments recommending the CAT governance structure include independent directors, the Participants noted that many of the Participants have independent representation on their governing boards, such that each Participant's input regarding the CAT would reflect independent views.⁷⁰⁶

The Commission notes that the Participants' proposed governance structure—with both an Operating Committee and an Advisory Committee—is similar to the governance structure used today by other NMS plans, and the Commission believes that this general structure is reasonably designed to allow the Participants to fulfill their regulatory obligations and, at the same time, provide an opportunity for meaningful input from the industry and other

702

Id.

703

The Participants explained this would impose an additional and direct financial burden on each Participant, thus each Participant's approval is important. Id. at 8.

704

The Participants explained this would directly impact each Participant's ability to meet its regulatory and compliance requirements, so it is critical that each Participant consent to this action. Id.

705

The Participants explained that this would ensure that all Operating Committee members would have knowledge of, and consider, all actions taken by the Operating Committee if an action by written consent is effected in lieu of a meeting. Id.

706

Id. at 7.

stakeholders.⁷⁰⁷ The Commission believes that it is reasonable for the Operating Committee to be composed exclusively of SROs. As the Participants point out, the CAT NMS Plan is the vehicle through which they will fulfill key regulatory and oversight responsibilities. The Commission notes the Participants' statutory obligations as SROs, the opportunity for Advisory Committee input on the CAT NMS Plan decisions, the opportunity for public comment on Plan amendments, and close Commission oversight, when reaching that determination.⁷⁰⁸

Furthermore, the Commission notes that the current provisions, which allocate voting rights such that each Participant has one vote, is consistent with other NMS plans and recognizes that the obligations imposed by Rule 613 on the SROs are also imposed on each SRO independently. With respect to the limited use of a unanimous voting standard, the Commission believes that the Plan is reasonably designed to facilitate effective governance and notes that only the three extraordinary Operating Committee actions specified above require unanimity, whereas all other Operating Committee actions can be accomplished with either a Majority Vote or Supermajority Vote.

The Commission notes that Commission Staff may observe all meetings (regular and special), including Executive Sessions, of the Operating Committee and Advisory Committee

⁷⁰⁷ See 17 CFR 242.613; *see, e.g.*, Securities Exchange Act Release Nos. 77679 (April 21, 2016), 81 FR 24908 (April 21, 2016) (NMS plan regarding addressing extraordinary market volatility); 75660 (August 11, 2015), 80 FR 48940 (August 14, 2015) (NMS plan regarding the consolidated tape association); 75504 (July 22, 2015), 80 FR 45252 (July 29, 2015) (NMS plan regarding consolidated quotations); 75505 (July 22, 2015), 80 FR 45254 (July 29, 2015) (NMS plan regarding unlisted trading privileges). The Commission believes it is reasonable for the CAT NMS Plan to include a governance structure similar to that utilized by other NMS plans that the Commission previously has found to be consistent with the Act. As noted above, the Commission is separately reviewing the EMSAC recommendations. *See supra* note 693.

⁷⁰⁸ For these reasons, the Commission does not believe it is necessary to mandate independent directors in the governance of the CAT.

and receive all minutes.⁷⁰⁹ The Commission anticipates that only a few members of Commission Staff would observe any given meeting.

The Commission also notes that independent of its review of the CAT NMS Plan, the EMSAC has been reviewing, among other things, the issues surrounding NMS plan governance. On June 10, 2016, the EMSAC presented its recommendations in this area to the Commission.⁷¹⁰

Finally, the Commission is amending Section 4.4(b) of the Plan to specify that the Operating Committee's discretion to deviate from the treatment, as set forth therein, of persons submitting a Form 1 application to become a national securities exchange or persons submitting a Form X-15AA-A application to become a national securities association, must be reasonable and not impose any unnecessary or inappropriate burden on competition. The Commission is also amending Section 3.3(b)(v) of the Plan to specify that the Operating Committee's discretion, in considering other factors in determining the Participation Fee of a new Participant, must be reasonable, equitable and not unfairly discriminatory. The Commission believes these amendments are appropriate because they set forth in the CAT NMS Plan specific limitations with respect to the Operating Committee's discretion that are consistent with existing SRO obligations under the Exchange Act.⁷¹¹

2. Advisory Committee

Article IV of the Plan establishes an Advisory Committee charged with advising the SROs on the implementation, operation, and administration of the Central Repository.⁷¹² Under

⁷⁰⁹ See Section IV.B.2, infra.

⁷¹⁰ See supra note 693.

⁷¹¹ 15 U.S.C. 78f(b)(4)–(5), (8).

⁷¹² See Section III.3, supra; see also CAT NMS Plan, supra note 5, at Section 4.13(a), (d).

the Plan, the Advisory Committee has the right to attend Operating Committee and Subcommittee meetings—unless they are held in Executive Session—and submit its views prior to a decision by the Operating Committee.⁷¹³ As proposed, the composition of the Advisory Committee includes (i) broker-dealers of varying sizes and types of business, including a clearing firm, (ii) an individual who maintains a securities account, (iii) an academic, (iv) institutional investors, and (v) the Commission’s Chief Technology Officer (or Commission equivalent), who while not formally a member of the Advisory Committee, serves as an observer.⁷¹⁴

Most comments regarding the Advisory Committee recommended formalizing and expanding its role.⁷¹⁵ Commenters made the following recommendations: (i) change the selection process of, and expand the membership of, the Advisory Committee;⁷¹⁶ (ii) form the Advisory Committee before the CAT NMS Plan is approved;⁷¹⁷ (iii) formalize procedures for Advisory Committee meetings, including requiring specific documentation and written correspondence; (iv) narrow the use of Operating Committee Executive Sessions, whereby the

⁷¹³ See Section III.3, *supra*; see also CAT NMS Plan, *supra* note 5, at Section 4.13(d).

⁷¹⁴ See Section III.3, *supra*; see also CAT NMS Plan, *supra* note 5, at Section 4.13(b).

⁷¹⁵ DAG Letter at 3; ICI Letter at 10–13; SIFMA Letter at 26–29; FIF Letter at 14, 135–37; see also STA Letter at 1–2 (supporting the SIFMA, FIF and DAG Letters’ Advisory Committee recommendations); but see NYSE Letter.

⁷¹⁶ TR Letter at 6–7; SIFMA Letter at 26–27; FIF Letter at 14, 135–37; see also STA Letter at 2 (supporting the SIFMA and FIF Letters’ Advisory Committee recommendations).

⁷¹⁷ DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

Advisory Committee is excluded from participating; and (v) adopt in the CAT NMS Plan, the EMSAC’s recommendations for NMS plan advisory committees.⁷¹⁸

One commenter suggested that the process for selecting Advisory Committee members should change to ensure that the Advisory Committee membership is independent of the SROs.⁷¹⁹ The commenter noted selection of Advisory Committee members independent from the Participants is critical in light of the inherent conflict of interest the Participants face as sponsors and overseers of a Plan that will, at the same time, impose obligations on the very same Participants.⁷²⁰ This commenter also recommended that the Advisory Committee members should be selected by broker-dealer representatives—not by the SROs—and in support of this position argued that the Advisory Committee’s purpose “should be to represent the interest of the industry and bring to bear the wide expertise of broker-dealers.”⁷²¹

Those commenters that advocated expanding the membership of the Advisory Committee⁷²² suggested including: (i) trade processing and order management service bureaus; (ii) registered funds; (iii) inter-dealer brokers; (iv) agency brokers; (v) retail brokers;

⁷¹⁸ SIFMA Letter at 26; ICI Letter at 10–13; see also STA Letter at 1–2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷¹⁹ SIFMA Letter at 27; see also STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷²⁰ SIFMA Letter at 27; see also STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷²¹ SIFMA Letter at 27; see also STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷²² SIFMA Letter at 27; FIF Letter at 14, 135–37; TR Letter at 6–7 (arguing that a service bureau representative should be added to the Advisory Committee to offer a “collective perspective” that comes from supporting multiple clients); ICI Letter at 10–13; see also STA Letter at 1–2 (supporting the SIFMA and FIF Letters’ Advisory Committee recommendations).

(vi) institutional brokers; (vii) proprietary trading firms; (viii) smaller broker-dealers; (ix) firms with a floor presence; (x) and industry/trade associations.⁷²³ One commenter recommended expanding the Advisory Committee to 20 members, with a minimum of 12 broker-dealers.⁷²⁴ Another commenter suggested including two financial economists (preferably academic) with expertise in both econometrics and the economics of the primary market and market microstructure.⁷²⁵

Another commenter recommended forming the Advisory Committee prior to the CAT NMS Plan receiving the Commission’s approval to “allow representative participation in the selection of the [Plan] Processor and in developing [o]perating procedures.”⁷²⁶

Commenters suggested increasing the governance role of the Advisory Committee, with one commenter advocating that “the Advisory Committee should be involved in every aspect of the CAT,”⁷²⁷ such as budgets, fees and charges, and new requirements that may significantly burden broker-dealers.⁷²⁸

⁷²³ TR Letter at 6; SIFMA Letter at 27; FIF Letter at 135; ICI Letter at 12; see also STA Letter at 2 (supporting the SIFMA and FIF Letters’ Advisory Committee recommendations).

⁷²⁴ FIF Letter at 135; see also STA Letter at 2 (supporting the FIF Letter’s Advisory Committee recommendations).

⁷²⁵ Hanley Letter at 6.

⁷²⁶ DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s Advisory Committee recommendations).

⁷²⁷ SIFMA Letter at 27; see also ICI Letter at 11; FIF Letter at 14, 135–37; STA Letter at 2 (supporting the FIF and SIFMA Letters’ Advisory Committee recommendations).

⁷²⁸ SIFMA Letter at 27; see also STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

To facilitate increasing the Advisory Committee's role in the CAT's governance, a few commenters offered concrete recommendations for procedural safeguards.⁷²⁹ Two commenters suggested that the Operating Committee be required to document a written rationale any time the Operating Committee rejects an Advisory Committee recommendation.⁷³⁰ One of these commenters recommended that all documents prepared for or submitted to the Operating Committee by the Plan Processor also be submitted to the Advisory Committee, to keep the Advisory Committee fully informed.⁷³¹ One commenter recommended that agendas and documentation for Operating Committee meetings be distributed to Advisory Committee members in advance of meetings.⁷³²

A commenter also recommended that all information concerning the operation of the Central Repository be made available to the Advisory Committee, except for limited information of a confidential regulatory nature.⁷³³ This commenter added that when information is deemed to be of a confidential regulatory nature, the SROs should maintain a written record of what is

⁷²⁹ SIFMA Letter 27–29; ICI Letter at 10–13; TR Letter at 6–7; see also STA Letter at 2 (supporting the SIFMA Letter's Advisory Committee recommendations). These recommendations are similar to the recommendations of the EMSAC.

⁷³⁰ SIFMA Letter at 28; ICI Letter at 13; see also STA Letter at 2 (supporting the SIFMA Letter's Advisory Committee recommendations).

⁷³¹ ICI Letter at 13.

⁷³² SIFMA Letter at 28; see also STA Letter at 2 (supporting the SIFMA Letter's Advisory Committee recommendations and noting its concern with the frequency and timeliness of information provided to the Advisory Committee).

⁷³³ SIFMA Letter at 28; ICI Letter at 10–13; see also STA Letter at 2 (supporting the SIFMA Letter's Advisory Committee recommendations).

designated confidential (and excluded from the Advisory Committee) and include an explanation of such designation.⁷³⁴

Two commenters recommended revising the confidentiality policies related to the CAT to permit Advisory Committee members to “share information from the [Advisory Committee] meetings with their colleagues and with other industry participants.”⁷³⁵ One commenter further suggested that an Advisory Committee member should be allowed to make other firm personnel available that may have relevant expertise if the Advisory Committee is “tasked with evaluating issues outside the members’ subject matter expertise.”⁷³⁶

Two commenters suggested that the Advisory Committee should have a right to review proposed amendments to the CAT NMS Plan that would affect CAT Reporters.⁷³⁷ One of these commenters noted that “[i]t may not be obvious to the Operating Committee when a change to the Plan impacts CAT [R]eporters in a material way.”⁷³⁸ The other commenter suggested modifying the Plan’s definition of a Material Amendment⁷³⁹ to distinguish between amendments

⁷³⁴ SIFMA Letter at 28; see also Fidelity Letter at 7 (noting the “Operating Committee determines the scope and content of information supplied to the Advisory Committee”); STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷³⁵ SIFMA Letter at 27, 28; DAG Letter at 3; see also STA Letter at 1–2 (supporting the SIFMA and DAG Letters’ Advisory Committee recommendations).

⁷³⁶ SIFMA Letter at 27; see also STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷³⁷ TR Letter at 7; FIF Letter at 136; see also STA Letter at 2 (supporting the FIF Letter’s Advisory Committee recommendations).

⁷³⁸ TR Letter at 7.

⁷³⁹ The CAT NMS Plan defines a “Material Amendment” to the Technical Specifications as an amendment that requires “a Participant or an Industry Member to engage in significant changes to the coding necessary to submit information to the Central Repository pursuant to the LLC Agreement or if it is required to safeguard the security or confidentiality of the CAT Data.” See CAT NMS Plan, supra note 5, at Section 6.9(c).

that are internal or external to the Plan Processor.⁷⁴⁰ This commenter recommended that both internal and external material amendments to the CAT NMS Plan be reviewed by the Advisory Committee, but be designated for different levels of review. This commenter suggested that material amendments that are “internal” to the Plan Processor would only be reviewed to ensure that they do not materially affect CAT Reporters; whereas, amendments that are “external” to the Plan Processor would require Advisory Committee consultation and an implementation plan with reasonable time for development and testing.⁷⁴¹

A commenter recommended specific CAT NMS Plan governance changes to expand and clarify the role of the Advisory Committee.⁷⁴² This commenter supported: (i) clarifying the process for selecting Advisory Committee representatives; (ii) expanding and formalizing the role of the Advisory Committee, such as providing it formal votes on matters before the Operating Committee and the ability to initiate its own recommendations; and (iii) significantly narrowing the use of Executive Sessions for the Operating Committee.⁷⁴³ Moreover, a commenter recommended that when the Operating Committee meets in Executive Session, the

⁷⁴⁰ FIF Letter at 136; see also STA Letter at 2 (supporting the FIF Letter’s Advisory Committee recommendations). The commenter references “external” material amendments as any change that affects the CAT Reporter Interface, such as coding or configuration changes. “Internal” material amendments are changes that do not affect the CAT Reporter interface (i.e., does not require coding or configuration changes).

⁷⁴¹ FIF Letter at 136; see also STA Letter at 2 (supporting the FIF Letter’s Advisory Committee recommendations).

⁷⁴² Fidelity Letter at 7.

⁷⁴³ Id. This commenter noted that the EMSAC provided these recommendations; see also SIFMA Letter at 28; STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

SROs should maintain a written record including an explanation of why an Executive Session is required.⁷⁴⁴

One commenter, an SRO, stated that “the governance structure in the proposed CAT NMS Plan would establish an appropriate advisory role for the Advisory Committee that is consistent with the requirements specified by the Commission in Rule 613.”⁷⁴⁵ This commenter stressed that while the SROs have a legal obligation under Commission rules to create, implement and maintain a consolidated audit trail and central repository, non-SROs do not have this legal obligation. Accordingly, this commenter stated its belief that Advisory Committee members should not have a voting right with respect to Operating Committee actions.⁷⁴⁶ Finally, this commenter argued that having non-SRO Advisory Committee members vote in connection with the CAT NMS Plan would be incompatible with the requirements of the Exchange Act and Commission rules that squarely place the obligations to implement and enforce “the CAT NMS Plan on the shoulders of the SROs.”⁷⁴⁷ In this regard, the commenter highlighted the Rule 613(f) requirement that SROs “develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the consolidated audit trail.”⁷⁴⁸

⁷⁴⁴ SIFMA Letter at 28; see also Fidelity Letter at 7 (noting there are “no limitations on when the Operating Committee can call an Executive Session” and that the Operating Committee can, for any reason, “prohibit the Advisory Committee from attending any Executive Session of the Operating Committee by a majority vote”); STA Letter at 2 (supporting the SIFMA Letter’s Advisory Committee recommendations).

⁷⁴⁵ NYSE Letter at 4.

⁷⁴⁶ Id.

⁷⁴⁷ Id. at 6.

⁷⁴⁸ Id.

Regarding the size and composition of the Advisory Committee, the Participants recommended amending the Plan to include a service bureau representative, because service bureaus “perform audit trail reporting on behalf of their customers . . . [and] would provide a valuable perspective on how the CAT and any enhancements thereto would affect the service bureau clients, which often include a number of small and medium-sized firms.”⁷⁴⁹ The Participants also recommended augmenting the institutional investor representation on the Advisory Committee by including institutional investor representation by an adviser from registered funds, and increasing from two to three institutional investor representatives with at least one of the institutional investor representatives trading on behalf of an investment company or group of investment companies registered pursuant to the Investment Company Act of 1940.⁷⁵⁰ The Participants also suggested removing references in the Advisory Committee eligibility requirements for those institutional investors “on behalf of a public entity . . . and on behalf of a private entity,” which is in response to a comment noting the vagueness of the terms “public” and “private” with respect to institutional investors.⁷⁵¹

The Participants, however, disagreed with commenters that the academic representative of the Advisory Committee should be limited to a financial economist because a general requirement that “a member of academia with expertise in the securities industry or any other industry relevant to the operation of the CAT System,” does not preclude a financial economist serving on the Advisory Committee so long as they have the relevant expertise.⁷⁵² The

⁷⁴⁹ Response Letter I at 9.

⁷⁵⁰ Id. at 10.

⁷⁵¹ Id.

⁷⁵² Id.

Participants also disagreed with commenters that members of industry trade groups should also serve on the Advisory Committee, noting that the CAT NMS Plan includes a variety of representatives from the members of such trade groups and would provide “a meaningful opportunity for the representation of the views of industry trade groups.”⁷⁵³ Furthermore, the Participants disagreed with commenters who advocated increasing the number of broker-dealer representatives on the Advisory Committee from seven to twelve, and increasing the size of the Advisory Committee from twelve to twenty members. The Participants noted that, in “balancing the goal of having a sufficient cross section of representation with the goal of having a well-run committee,” seven broker-dealers of varying sizes and business types would provide “significant opportunity to provide [broker-dealers’] views” and increasing an Advisory Committee from twelve to twenty creates a committee structure that would “likely hamper, rather than facilitate,” discussion.⁷⁵⁴

In response to commenters recommending a more active and participatory role in operation of the CAT for non-SRO stakeholders, the Participants stated that the Plan strikes an appropriate balance between providing the “industry with an active role in governance while recognizing the Participants’ regulatory obligations with regard to the CAT.”⁷⁵⁵ In response to a commenter recommending that Advisory Committee members be selected by broker-dealer representatives, the Participants stated their belief that the Operating Committee should select the members, but agreed with commenters that the Advisory Committee should be permitted to

⁷⁵³ Id.

⁷⁵⁴ Id. at 10–12.

⁷⁵⁵ Id. at 13–14.

advise the Operating Committee regarding potential Advisory Committee members.⁷⁵⁶ The Participants suggested that the CAT NMS Plan be amended to permit the Advisory Committee to advise the Operating Committee on Advisory Committee member selection, provided however, that the Operating Committee in its sole discretion would select members of the Advisory Committee.⁷⁵⁷

In response to comments recommending formalized modes of written communication between the Operating Committee and the Advisory Committee, the Participants recommended that the CAT NMS Plan remain unchanged.⁷⁵⁸ In support, the Participants stated their belief that the proposed structure adequately addresses the commenters' concerns, while recognizing the need for the Participants to have the opportunity to discuss certain matters, particularly certain regulatory and security issues, without the participation of the industry.⁷⁵⁹ The Participants also noted that the Advisory Committee is permitted to attend all of the non-Executive Session Operating Committee meetings, where information concerning the operation of the CAT is received (subject to the Operating Committee's authority to determine the scope and content of information supplied to the Advisory Committee).⁷⁶⁰ Further, the Participants stated that minutes, subject to customary exceptions for confidentiality and privilege considerations, will be provided to the Advisory Committee. Finally, the Participants did not support instituting formalized modes of written communication between the Operating Committee and the Advisory

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Id.

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Id.

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Id. at 15–16.

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Id. at 16.

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Id.

Committee because such “an overly formulaic approach to [Operating Committee] interactions” would “hamper, rather than enhance, [Operating Committee] interactions with the Advisory Committee.”⁷⁶¹

With respect to comments recommending narrowing the use of Operating Committee Executive Sessions, the Participants stated their belief that the Operating Committee’s capabilities to meet in Executive Session are appropriate and cited the Commission’s statement in the Adopting Release that: “meet[ing] in [E]xecutive [S]ession without members of the Advisory Committee appropriately balances the need to provide a mechanism for industry input into the operation of the central repository, against the regulatory imperative that the operations and decisions regarding the consolidated audit trail be made by SROs who have a statutory obligation to regulate the securities markets, rather than by members of the SROs, who have no corresponding statutory obligation to oversee the securities markets.”⁷⁶² The Participants represented that their intended use of an Executive Session is for limited purposes requiring confidentiality and offered four examples: matters that present an actual or potential conflict of interest for Advisory Committee members (e.g., relating to member’s regulatory compliance); discussion of actual or potential litigation; CAT security issues; and personnel issues. The Participants also noted that Executive Sessions must be called by a Majority Vote and that the meeting minutes are recorded, subject to confidentiality and attorney-client privilege considerations.⁷⁶³

⁷⁶¹ Id.

⁷⁶² Id. at 15.

⁷⁶³ Id.

Finally, in response to comments that the Advisory Committee should form before the approval of the CAT NMS Plan, the Participants noted that the Plan itself provides for the establishment of the Operating Committee and the Advisory Committee and thus cannot be formed until the Commission approves the Plan. The Participants also noted that the DAG provides the Participants with “advice regarding the development of the Plan from an industry perspective.”⁷⁶⁴

For reasons discussed below, the Commission finds reasonable the Participants’ suggested modifications to add a service bureau representative, increase the number of institutional investor representatives on the Advisory Committee, remove terms that create vagueness for the institutional investor representative categories, and make the applicable conforming changes to Section 4.13 of the Plan. Accordingly, after considering the comments, the Commission is amending Section 4.13 of the Plan to include a service bureau representative, increase the number of institutional investor representatives from two (2) to three (3), and remove the terms that a commenter identified as creating vagueness with respect to the institutional investor category.

The Commission understands that service bureaus frequently serve a core role in reporting CAT Data on behalf of broker-dealers, and as such, the Commission finds appropriate their inclusion as an Advisory Committee member. Further, the Commission finds the increase from two to three members on the Advisory Committee representing institutional investors, as well as removing the references to “on behalf of a public entity” and “on behalf of a private entity” due to the vagueness of such terms with respect to institutional investor Advisory

⁷⁶⁴ Id. at 16.

Committee members, to be reasonable responses to commenters seeking additional representation and clarity. The Commission also agrees with the Participants that it is reasonable to not mandate inclusion of representatives on the Advisory Committee from industry and trade associations, given the existing substantial industry representation on the Advisory Committee, which is reasonably designed to ensure a wide range of meaningful industry perspectives.

The Commission agrees with commenters who argued that the academic representative on the Advisory Committee should be a financial economist. The Commission acknowledges the Participants' response that a financial economist is not precluded from serving as the academic representative of the Advisory Committee, but the Commission believes that specifying that the academic representative must be a financial economist is appropriate to ensure the Advisory Committee and the Operating Committee have access to such expertise in assessing the CAT's operations and development. Accordingly, the Commission is amending Section 4.13(b)(ix) of the Plan to specify that the academic representative on the Advisory Committee must be a financial economist.

The Commission agrees with the Participants' suggestion, in response to commenters, to permit the Advisory Committee to recommend Advisory Committee candidates to the Operating Committee. Accordingly, the Commission is amending Section 4.13(d) of the Plan to permit the Advisory Committee to recommend Advisory Committee candidates to the Operating Committee, but notes that the Operating Committee still maintains the sole discretion to select members of the Advisory Committee.

The Commission believes the amendment is reasonably designed to ensure a robust selection process for Advisory Committee membership that identifies candidates that best represent the industry perspective. With respect to the comment suggesting that the Advisory

Committee be established before the approval of the CAT NMS Plan, the Commission notes it would be premature and technically not possible to establish an advisory committee to an NMS plan before such plan has been approved by the Commission. Moreover, the Commission notes that the interests of the industry and other stakeholders have been represented through the DAG, the public comment process, and through the SROs themselves as the CAT NMS Plan has been developed.

The Commission is amending the Executive Sessions provision in Section 4.4(a) of the Plan, as well as the Advisory Committee provision in Section 4.13(b) of the Plan related to the Commission's Chief Technology Officer (or equivalent) being an observer of the Advisory Committee. As the Commission is responsible for regulatory oversight of the Participants and the CAT NMS Plan, the Commission believes that it is appropriate for the Plan to expressly provide that Commission Staff may attend all CAT NMS Plan meetings, including those held in Executive Session. Similarly, because the Commission has broad regulatory responsibility for the Plan, the Commission does not believe it is appropriate to limit to the Commission's Chief Technology Officer (or equivalent) the right to serve as an observer at Advisory Committee meetings. Accordingly, the Commission is amending Sections 4.4(a) and 4.13(b) to provide that Commission Staff may attend Executive Sessions, and to permit the Commission to select the Commission representative to observe Advisory Committee meetings. The Commission anticipates that only a few members of Commission Staff would observe any given meeting.

The Commission also is amending Section 4.13(e) of the Plan in response to comments to provide that the Advisory Committee shall receive the same documents and information concerning the operation of the Central Repository as the Operating Committee. The Operating Committee may, however, withhold such information to the extent it reasonably determines such

information requires confidential treatment. Although the Plan as filed permits Advisory Committee members to attend all of the non-Executive Session Operating Committee meetings, with respect to information concerning the operation of the CAT, it allows the Operating Committee broad discretion to determine the scope and content of information supplied to the Advisory Committee. The Commission believes it is important for the Advisory Committee to fulfill its role that its members receive full information on Plan operations (other than confidential information) and that it is therefore appropriate to amend Section 4.13(e) of the Plan accordingly.

With respect to the other comments regarding authority, composition and role of the Advisory Committee, as well as the use of the Operating Committee Executive Sessions, the Commission notes that the Plan provisions relating to the Advisory Committee and the Operating Committee Executive Sessions are similar to those in other NMS plans and are, therefore, reasonable.⁷⁶⁵

3. Officers of the Company

The CAT NMS Plan requires the Company to appoint a CISO and a CCO, who shall be employees solely of the Plan Processor.⁷⁶⁶ The Plan acknowledges that the CISO and CCO may have fiduciary and other similar duties to the Plan Processor pursuant to their employment with

⁷⁶⁵ As previously stated, the Commission believes it is reasonable for the CAT NMS Plan to include a governance structure similar to that utilized by other NMS plans that the Commission previously has found to be consistent with the Act. As with the comments regarding the Operating Committee, some of the suggestions made by commenters regarding the Advisory Committee are mirrored in the EMSAC recommendations. As already discussed, the Commission is separately reviewing these EMSAC recommendations. See supra note 693.

⁷⁶⁶ See Section III.3, supra; see also CAT NMS Plan, supra note 5, at Section 4.6(a).

the Plan Processor, and the Plan, as proposed, sets forth that to the extent permitted by law, the CISO and CCO will have no fiduciary or similar duties to the Company.⁷⁶⁷

One commenter expressed concern that appointing a CISO and CCO who would both be officers of the Company and employees of the Plan Processor “creates a potential conflict of interest that would undermine the ability of these officers to effectively carry out their responsibilities under the CAT NMS Plan because they would owe a fiduciary duty to the Plan Processor rather than to the [Company].”⁷⁶⁸ This commenter recommended that the officers of the Company should be required to act in the best interest of the [Company] to avoid conflicts of interest in carrying out their oversight activities.⁷⁶⁹ In addition, this commenter suggested that the CAT NMS Plan impose a fiduciary duty on the CISO and CCO, or at a minimum require the Plan Processor to select individuals who do not have a fiduciary duty to the Plan Processor to serve in these roles.⁷⁷⁰

In response to these comments, the Participants suggested that the CAT NMS Plan be changed so that all Officers of the Company, including the CISO and CCO, have fiduciary duties to the Company in the same manner and extent as an officer of a Delaware corporation.⁷⁷¹ The Participants also represented that the Operating Committee, in an agreement with the Plan Processor, will have the Plan Processor acknowledge that the Officers of the Company will owe fiduciary duties to the Company, and to the extent that the duties owed to the Company by the

⁷⁶⁷ See Section III.3, supra; see also CAT NMS Plan, supra note 5, at Sections 4.6(a), 4.7(c).

⁷⁶⁸ FSI Letter at 3.

⁷⁶⁹ Id.

⁷⁷⁰ Id.

⁷⁷¹ Response Letter I at 18–19.

Officers of the Company, including the CISO or CCO, conflict with any duties owed to the Plan Processor, the duties to the Company should control.⁷⁷²

The Commission believes that the suggested modifications by the Participants in response to comments about potential conflicts of interest are reasonable. Accordingly, the Commission is amending Section 4.7(c) of the Plan so that each Officer shall have the same fiduciary duties and obligations to the Company as a comparable officer of a Delaware corporation and in all cases shall conduct the business of the Company and execute his or her duties and obligations in good faith and in the manner that the Officer reasonably believes to be in the best interests of the Company. Furthermore, the Commission is amending Section 4.6(a) of the Plan to codify the Participants' representation that that the Operating Committee, in an agreement with the Plan Processor, will have the Plan Processor acknowledge that the Officers of the Company will owe fiduciary duties to the Company, and to the extent that the duties owed to the Company by the Officers of the Company, including the CISO or CCO, conflict with any duties owed to the Plan Processor, the duties to the Company should control.

The Commission believes that amending the CAT NMS Plan to expressly affirm the Officers' fiduciary duties or similar duties or obligations to the Company provides clarity and assurances that the Officers will act in the best interests of the Company.⁷⁷³ The Commission also believes it is reasonable, as the Participants have suggested in their response to comments, to have the Company and the Plan Processor enter into an agreement that specifies not only that Officers have fiduciary duties and obligations to the Company, but that if such Officers may

⁷⁷² Id. at 18.

⁷⁷³ While the SROs expressly waive fiduciary obligations to the Company, the SROs are subject to statutory obligations to regulate the securities markets and to create, implement and maintain the CAT.

have competing duties and obligations owed to the Company and to the Plan Processor, the duties and obligations to the Company should control. At this time, it is unclear what competing duties and obligations Officers may owe to the Company and the Plan Processor. While in many cases, the Officers' duties towards the Plan Processor and the Company are likely to be aligned, there may be circumstances (e.g., related to the performance of the Plan Processor) where such duties may conflict and the Commission finds reasonable that in such circumstances, the duties to the Company should control in order to mitigate any conflict between the interests of the Plan Processor and those of the Company in administering the CAT. The Commission further notes that the CAT NMS Plan provides reasonable oversight of the Officers by the Operating Committee, for example, the Plan requires: (i) the Operating Committee to approve the CISO and CCO with a Supermajority Vote⁷⁷⁴; (ii) the CISO and CCO to devote, with minor exceptions, their entire working time to serving as the CISO and CCO⁷⁷⁵; (iii) the Operating Committee to oversee that the Plan Processor allocates appropriate resources for the CISO and CCO to fulfill their obligations⁷⁷⁶; (iv) the CISO and CCO to report directly to the Operating Committee with respect to their duties⁷⁷⁷; (v) the compensation of the CISO and CCO to be subject to the Operating Committee's review and approval⁷⁷⁸; and (vi) an annual performance review of the CISO and CCO to be conducted by the Operating Committee.⁷⁷⁹

⁷⁷⁴ See CAT NMS Plan, supra note 5, at Section 6.2(a)(i), (b)(i).

⁷⁷⁵ See id. at Section 6.2(a)(i), (b)(i).

⁷⁷⁶ See id. at Section 6.2(a)(ii), (b)(ii).

⁷⁷⁷ See id. at Section 6.2(a)(iii), (b)(iii).

⁷⁷⁸ See id. at Section 6.2(a)(iv), (b)(iv).

⁷⁷⁹ See id. at Section 6.2(a)(iv), (b)(iv).

4. Additional Governance Provisions

Commenters raised additional governance concerns related to conflicts of interest for the Participants, whether there should be an audit committee, and whether the Participants should be required to coordinate the administration of the CAT from a legal, administrative, supervisory and enforcement perspective.⁷⁸⁰

Some commenters expressed concern that the Participants would have a conflict of interest because of the various roles they perform with respect to the CAT. One commenter stated that the Participants are “sponsors and overseers of the Plan, while at the same time, the Plan will impose obligations on [them].”⁷⁸¹ Another commenter raised concerns that the Participants would “control the [O]perating [C]ommittee for the [P]lan, use CAT [D]ata for regulatory purposes, and potentially commercialize the information that they report to the CAT.”⁷⁸² This commenter suggested that these roles may “present conflicting incentives” for Participants.⁷⁸³

One commenter argued that the Participants should not oversee and control the CAT and recommended instead that the Commission should build and host the CAT, which would then be under the Commission’s direct and sole control.⁷⁸⁴ In support of this view, the commenter stated the Commission’s statutory mission to protect investors would make it better positioned to operate the CAT, as compared to for-profit SROs, who would seek to maximize profits from the

⁷⁸⁰ See SIFMA Letter at 27, 29; ICI Letter at 12; Better Markets Letter at 5–6; DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁷⁸¹ SIFMA Letter at 27.

⁷⁸² ICI Letter at 12.

⁷⁸³ Id.

⁷⁸⁴ Better Markets Letter at 5.

CAT Data.⁷⁸⁵ The commenter suggested that the Commission could outsource the building of the CAT and fund the CAT similar to how it funds its EDGAR system.⁷⁸⁶ The commenter stated that CAT NMS, LLC should reorganize as a not-for-profit entity and set forth an organizational purpose aligned with the Commission’s mission statement.⁷⁸⁷ Finally, the commenter argued that the Commission solely should control access to and usage of the CAT System.⁷⁸⁸

Two commenters recommended that the Company governance structure include an audit committee.⁷⁸⁹ One commenter noted that the audit committee should be comprised of mostly independent directors.⁷⁹⁰ Another commenter stated the audit committee should be responsible for the oversight of how the CAT’s revenue sources are used for regulatory purposes, and that the costs and financing of the CAT must be fully transparent and publicly disclosed in annual reports, including audited financial statements.⁷⁹¹

⁷⁸⁵ Id. at 5–6.

⁷⁸⁶ Id. at 6.

⁷⁸⁷ Id. The commenter recommended that the board of directors of such entity contain a super-majority of independent directors to oversee the not-for-profit CAT NMS, LLC, and that the chair of the board of directors should be non-industry and appointed by the Commission. Further, the commenter recommended that the Director of the Division of Trading and Markets permanently serve as the vice-chair of the board of directors. Better Markets Letter at 6; see also DAG Letter at 3 (arguing that the CAT corporate governance structure should have independent directors comprised of both non-industry and industry participants); STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁷⁸⁸ Better Markets Letter at 6.

⁷⁸⁹ SIFMA Letter at 29; DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations).

⁷⁹⁰ DAG Letter at 3; see also STA Letter at 1 (supporting the DAG Letter’s governance recommendations). The Commission notes that the commenter specified in its comment that their definition of independent director includes industry participants (i.e., broker-dealers). See DAG Letter at 3.

⁷⁹¹ SIFMA Letter at 29.

Finally, one commenter suggested that the SROs should coordinate the administration of the CAT through a single centralized body from a legal, administrative, supervisory and enforcement perspective.⁷⁹² The commenter recommended amending the Plan to require this coordination, and suggested that such coordination could be facilitated through agreements under SEC Rule 17d-2, regulatory service agreements or some combination thereof.⁷⁹³ In support of this view, the commenter noted that different CAT-related compliance requirements among the SROs might arise and subject firms to duplicative regulation and enforcement, with the accompanying inefficiencies, additional costs, and potential inconsistencies.⁷⁹⁴

In response to commenters suggesting the formation of an audit committee, the Participants stated that they would have the ability to review CAT-related issues objectively because “members of the Operating Committee are not employed by the [Company] and are fulfilling mandated regulatory oversight responsibilities, and that the [Company] will not operate as a profit-making company, which may need more scrutiny as compared to a company that is operating on a break-even basis.”⁷⁹⁵ Further, the Participants noted that the CAT NMS Plan requires that a Compliance Subcommittee be established—and noted that the Operating Committee in the future could decide if an audit committee should be formed as a subcommittee.⁷⁹⁶

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Id.

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Id.

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Id.

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Response Letter I at 8.

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Id. at 9.

In response to commenters regarding the coordinated compliance and enforcement oversight of the CAT, the Participants acknowledged the benefits of having a single Participant be responsible for enforcing compliance with Rule 613 and the CAT NMS Plan through Rule 17d-2 agreements, regulatory services agreements or some other approach and represented that they would consider such an arrangement after the CAT NMS Plan's approval.⁷⁹⁷ As discussed in Section IV.H, the Commission is amending Section 6.6 of the Plan to require that the Participants provide the Commission within 12 months of effectiveness of the Plan, a report detailing the Participants' consideration of coordinated surveillance (e.g., entering into 17d-2 agreements or regulatory services agreements).⁷⁹⁸

The Commission acknowledges the commenters' concern about the conflicts inherent in having SROs performing various roles as overseers of the Plan and at the same time enforcing compliance with Rule 613. The Commission, however, highlights that the Participants are performing roles specified pursuant to obligations under the Exchange Act and the rules thereunder and remain under the direct oversight of the Commission. With respect to comments expressing concerns that the Participants may be in a position to commercialize the respective Raw Data reported by each SRO submitting to the CAT, order and execution information is already collected by SROs from its members and they are permitted under current law to commercialize this data (e.g., direct market feeds, provided that the terms are fair and reasonable and not unreasonably discriminatory⁷⁹⁹) subject to appropriate rule filings and oversight by the

⁷⁹⁷ Id. at 17.

⁷⁹⁸ See Section IV.H., supra.

⁷⁹⁹ 17 CFR 242.603.

Commission.⁸⁰⁰ Thus, the Plan does not expand the Participants' ability to commercialize their Raw Data beyond what is currently permitted.

With respect to comments that suggested that the Participants should not oversee and control the CAT, but that instead it should be under the Commission's direct and sole control, the Commission notes that in the Adopting Release, the Commission mandated that the Participants develop an NMS plan for the development and operation of the CAT. As such, the CAT NMS Plan, as noticed, whereby the Participants directly manage the CAT, was in furtherance of Rule 613 as adopted. Additionally, because the Participants, as SROs, currently serve as front-line regulators of many aspects of the securities markets, including administering the existing sources of regulatory data, the Commission believes they are well positioned to oversee the CAT. Moreover, the Commission believes that any potential conflicts arising from the status of certain Participants as for profit enterprises are reasonably addressed through the Plan provisions and Commission oversight.

The Commission concurs with the Participants that it is reasonable for the Company not to have an audit committee at this time. Further, the Participants are permitted to form an audit committee, as a subcommittee of the Operating Committee. The Commission notes that the absence of a requirement for an audit committee is consistent with other NMS plans.

Section 9.2(a) of the Plan states that the Operating Committee shall maintain a system of accounting for the Company established and administered in accordance with GAAP (or another standard if determined appropriate by the Operating Committee). Section 9.2(a) also requires,

⁸⁰⁰ See, e.g., Securities Exchange Act Release Nos. 73918 (December 23, 2014), 79 FR 78920 (December 31, 2014) (BATS One Feed); 74128 (January 23, 2015), 80 FR 4951 (January 29, 2015) (NYSE Integrated Feed).

among other things, that the Company prepare and provide to each Participant an audited balance sheet, income statement and statement of cash flow, to the extent the Operating Committee deems advisable. In addition, Section 9.2(c) of the Plan states that all matters concerning accounting procedures shall be determined by the Operating Committee. The Participants recommended that the Commission amend Section 9.2(a) to eliminate the flexibility for the Company to administer a system of accounting in accordance with non-GAAP standards, thus requiring that all financial statements or information that may be supplied to the Participants shall be prepared in accordance with GAAP.⁸⁰¹ In addition, the Participants recommended amending the Plan to eliminate the discretion of the Operating Committee to provide financials only if it deems advisable and instead to require that the Company's audited annual balance sheet, income statement, and statement of cash flows be audited by an independent public accounting firm and made publicly available.⁸⁰² The Commission believes that the changes recommended by the Participants are reasonable because they will promote greater accuracy and transparency with respect to the Company's financial accounting and is therefore amending the Plan accordingly.

Section 6.1(o)(vi) of the Plan states that financial statements of the Plan Processor, prepared in accordance with GAAP and audited by an independent public accounting firm or certified by the Plan Processor's Chief Financial Officer, shall be provided to the Operating Committee no later than 90 days after the Plan Processor's fiscal year end. The Participants recommended that the Commission amend the Plan to change this timeframe to 180 days after the Plan Processor's fiscal year end to provide further flexibility to the Plan Processor with

⁸⁰¹ Participants' Letter II at 2.

⁸⁰² Participants' Letter II at 2.

respect to the preparation of its financial statements.⁸⁰³ The Commission believes that it is reasonable to provide this additional flexibility and is therefore amending the Plan accordingly.

The Commission also agrees with the commenters and Participants that a coordinated approach to self-regulatory oversight may have benefits, such as regulatory efficiencies and consistency, but believes that it is reasonable for such an arrangement to be considered by the Participants after the CAT NMS Plan’s approval rather than mandating a specific approach for SRO coordination under the Plan at this time—as the Plan Processor has not been selected nor has the CAT System been developed. The Commission nevertheless notes that, as described above, it is amending the CAT NMS Plan to require a written assessment by the Participants within 12 months of effectiveness of the Plan, considering coordinated surveillance (e.g., entering into Rule 17d-2 agreements, regulatory services agreements or other arrangements, to facilitate regulatory coordination).⁸⁰⁴

Finally, the Commission notes that the CAT NMS Plan provides that books and records of the CAT LLC shall be made available to the Commission upon “reasonable request.”⁸⁰⁵ Because the CAT LLC is a facility of the Participants, the Commission has the right to the books and records of CAT LLC “upon request” under Exchange Act Rule 17a-1,⁸⁰⁶ and therefore is amending Section 9.1 of the Plan to delete the requirement that any request for the CAT LLC’s books and records be “reasonable.”

⁸⁰³ Participants’ Letter II at 1.

⁸⁰⁴ See Section IV.H, infra.

⁸⁰⁵ See CAT NMS Plan, supra note 5, at Section 9.1.

⁸⁰⁶ 17 CFR 240.17a-1(c).

C. Plan Processor Selection (Article V)

Article V of the CAT NMS Plan sets forth the process for selecting the Plan Processor following approval of the CAT NMS Plan.⁸⁰⁷ The Plan Processor selection provisions in Article V are identical to the selection process set forth in the Selection Plan.⁸⁰⁸

The Commission received three comments suggesting that the Plan Processor selection process be accelerated,⁸⁰⁹ with some commenters suggesting that the Selection Plan be amended to require the selection of the Plan Processor prior to the approval of the CAT NMS Plan.⁸¹⁰ According to one commenter, the earlier selection of a Plan Processor would advance the release and development of the Technical Specifications.⁸¹¹ Another commenter offered support for a specific Bidder, noting their regulatory and technical competencies.⁸¹² One commenter recommended that the Commission re-open the Plan Processor's agreement with CAT NMS, LLC every five years to ensure that the Plan remains state-of-the-art, and to provide a process for public input.⁸¹³ Another commenter stated that the Plan does not set forth sufficient incentives for the Plan Processor and the Participants to incorporate new technology into or to continuously innovate and strive to reduce the costs of the CAT System.⁸¹⁴

⁸⁰⁷ See Section III.4, supra, for a more detailed description of the Selection Plan.

⁸⁰⁸ See Selection Plan, supra note 23.

⁸⁰⁹ FSR Letter at 10; TR Letter at 4–5; FIF Letter at 42–43.

⁸¹⁰ TR Letter at 4–5; FIF Letter at 42–43.

⁸¹¹ TR Letter at 4–5; see also Section V.G.4, infra, for a further discussion of these comment letters.

⁸¹² Anonymous Letter I at 1 (advocating for FINRA's regulatory abilities related to OATS); but see Anonymous Letter II (criticizing FINRA's handling of OATS non-compliance).

⁸¹³ Better Markets Letter at 7.

⁸¹⁴ Data Boiler Letter at 17, 27.

In response to the comments to accelerate the Plan Processor selection process, the Participants acknowledged that the selection of the Plan Processor will likely affect implementation issues and related costs,⁸¹⁵ but that it is not feasible to accelerate the selection of the Plan Processor prior to the Commission's approval of the Plan. The Participants noted that until the Plan is finalized and approved by the Commission, the requirements of the CAT could change, which could impact the selection of the Plan Processor.⁸¹⁶ Moreover, the Participants noted that Rule 613's requirement that the Plan Processor be selected within two months after effectiveness of the Plan ensures that the selection of the Plan Processor will occur expeditiously once the Commission approves the Plan.⁸¹⁷

In response to the comment in support for a specific Bidder, the Participants stated that they determined that utilizing a competitive bidding process to select the Plan Processor was the most appropriate way to promote an innovative and efficient CAT solution.⁸¹⁸ Pursuant to that process, the Participants noted that they have reduced the number of Bidders to three Shortlisted Bidders.

In response to the comment to re-open the Plan Processor's agreement with the CAT LLC every five years and to provide a process for public input on the agreement, the Participants stated that they agree that it is important to ensure that the CAT solution remains effective and efficient going forward.⁸¹⁹ Accordingly, the Participants noted that they have proposed a process

⁸¹⁵ Response Letter I at 51.

⁸¹⁶ The Participants note in Response Letter I that the Selection Plan contemplates the selection of the Plan Processor after the approval of the Plan. Id. at 52.

⁸¹⁷ 17 CFR 242.613(a)(3)(i).

⁸¹⁸ Response Letter I at 52.

⁸¹⁹ Id.

for regularly reviewing the performance of the Plan Processor throughout the term of the Plan Processor's agreement and for modifying it if necessary to avoid an outdated CAT solution. The Participants added that, as set forth in the Plan, the Operating Committee will review the Plan Processor's performance under the Plan at least once each year, or more often than once each year upon the request of two or more Participants that are not Affiliated Participants.⁸²⁰ In addition, the Participants noted that the Plan sets forth the process for removing the Plan Processor. Specifically, the Participants noted that the Operating Committee, by Supermajority Vote, may remove the Plan Processor from such position at any time, and that the Operating Committee may, by Majority Vote, remove the Plan Processor from such position at any time if it determines that the Plan Processor has failed to perform its functions in a reasonably acceptable manner in accordance with the provisions of the Plan. The Participants stated that if they were to vote to remove the Plan Processor, the Operating Committee would select a new Plan Processor through a competitive bidding process.

In approving the Selection Plan, the Commission stated that the Selection Plan is reasonably designed to achieve its objective of facilitating the development of the CAT NMS Plan and the selection of the Plan Processor.⁸²¹ The Commission also found that the Selection Plan is reasonably designed to govern the process by which the SROs will formulate and submit the CAT NMS Plan, including the review, evaluation, and narrowing down of Bids in response to the RFP, and ultimately choosing the Plan Processor that will build, operate, and maintain the consolidated audit trail.⁸²² The Commission believes that the process set out in the Selection

⁸²⁰ See supra note 67 for a definition of "Affiliated Participants."

⁸²¹ See Selection Plan Approval Order, supra note 23.

⁸²² See id.

Plan for selecting a Plan Processor remains a reasonable approach, which will facilitate the selection of Plan Processor through a fair, transparent and competitive process and that no modifications to the Selection Plan are required to meet the approval standard. In response to the commenters recommending that the Plan Processor selection process be accelerated, the Commission agrees with the Participants that changes to the CAT NMS Plan that are being made in this Order may be relevant to the selection of the Plan Processor. The Commission believes that selecting the Plan Processor within two months of Plan approval, rather than prior to Plan approval, will allow the remaining Bidders to consider the CAT NMS Plan, as amended and approved by the Commission, and to make any necessary modifications to their Bids, which will enable the Participants to make a more fully informed decision on the Plan Processor in light of the amended and approved CAT NMS Plan.⁸²³ The Commission believes this timeframe to select the Plan Processor—two months following Commission approval of the Plan—will not result in the untimely release of the Technical Specifications.

In response to the comment that offered support for a specific Bidder, the Commission agrees with the Participants that the competitive bidding process to select the Plan Processor is a reasonable and effective way to choose a Plan Processor and thus believes that the process set forth in the Selection Plan should be permitted to continue. In response to the commenter that recommended that the Commission re-open the Plan Processor’s agreement with the CAT LLC every five years and provide a process for public input on the agreement, the Commission believes that the CAT NMS Plan already contains provisions that permit the reevaluation—and

⁸²³ In addition, the Commission notes that, pursuant to an amendment to the Selection Plan, the Participants have already narrowed the Bidders to three Shortlisted Bidders, which will facilitate the timely completion of the Plan Processor selection process. See Selection Plan, supra note 23.

possible replacement—of the Plan Processor. Thus, the Commission is not amending the plan to require that the Plan Processor’s agreement with the CAT LLC be reevaluated every five years.

Finally, in response to the commenter that stated that the Plan does not provide sufficient incentives for the Plan Processor and the Participants to incorporate new technology, innovate and reduce the costs of the CAT System, the Commission believes that requirements for regular evaluations of the operation of the CAT, the identification of potential improvements, and the delivery of a written assessment to the Commission, as well as the Plan’s provisions regarding the possible removal of the Plan Processor provide sufficient incentives for the Plan Processor and the Participants in these areas.⁸²⁴

D. Functions and Activities of the CAT System (Article VI)

Article VI of the CAT NMS Plan sets forth the functions and activities of the CAT System.⁸²⁵

1. Data Recording and Reporting Requirements

Article VI of the Plan imposes requirements regarding what data elements must be reported to the Central Repository and by when. The Commission received comments regarding to whom these requirements should apply and the appropriateness of the provisions.

One commenter recommended that firms using manual orders that are currently exempt from OATS reporting pursuant to FINRA Rule 7470 should also be exempt from the CAT reporting obligations.⁸²⁶ This commenter argued that to qualify for such an exemption, a firm

⁸²⁴ See CAT NMS Plan, supra note 5, at Section 4.3(b)(ii) (providing that the Operating Committee may terminate the Plan Processor without cause).

⁸²⁵ See Section IV.B., supra.

⁸²⁶ Wachtel Letter at 1–2.

would need to “eliminate many practices of regulatory concern” and have a “perfect regulatory history,” and that the exemption would have little impact on the CAT because it would exclude only the reporting of events that take place prior to delivery of an order to a market venue. The commenter argued that the exemption is necessary to keep currently-exempt firms in business due to the high costs that CAT reporting would impose.⁸²⁷ This commenter further argued that the requested exemption for OATS-exempt firms would not be the same as an exemption for “small firms,” and that wrongdoers would not fall within this exemption because of the limitations on the level of market activity, the voluntary restrictions from operations such as market making and trading with customers, the use of manual orders, and the expected high levels of compliance.⁸²⁸

Another commenter broadly stated that the data recording and reporting procedures described in the CAT NMS Plan are inappropriate and unreasonable.⁸²⁹ This commenter also stated that it may be easier for the Plan Processor to work directly with service bureaus, rather than with individual CAT Reporters, on data submission.⁸³⁰

In response to the commenter’s request that OATS-exempt firms also be exempted from reporting to the CAT, the Commission believes that completely exempting any group of broker-dealers from reporting requirements would be contradictory to the goal of Rule 613, which is to

⁸²⁷ Id.

⁸²⁸ Id.

⁸²⁹ Data Boiler Letter at 18. Specifically, the commenter argued that to link information accurately, there must be “a robust event sequencing method,” and stated that the Plan lacks sufficient detail on this matter. The commenter further suggested that order and execution information should be represented in a meaningful way and recommended expressing this information in audio/musical notes form.

⁸³⁰ Id. at 19-20.

create an accurate, complete, accessible and timely audit trail.⁸³¹ To permit such an exemption would eliminate the collection of audit trail information from a segment of broker-dealers and would thus result in an audit trail that does not capture all orders by all participants in the securities markets. The Commission believes that the CAT should contain data from all broker-dealers, including those that may appear to be at low risk for wrong-doing based on their history of compliance or business model. Regulators will not only use the CAT for surveillance and investigations, but also for market reconstructions and market analyses. Therefore, data from all broker-dealers is necessary.⁸³²

The Commission believes that the data recording and reporting procedures outlined in the CAT NMS Plan meet the requirements of Rule 613⁸³³ and are reasonable in that they are designed to ensure that data is recorded and reported in a manner that will provide regulators access to linked CAT Data that is timely, accurate, secure, and complete.⁸³⁴ Further, while under certain circumstances it might be efficient for the Plan Processor to work directly with service bureaus, the reporting requirements in the CAT NMS Plan apply to CAT Reporters, which are

⁸³¹ The Participants did not respond to this comment.

⁸³² As discussed in more detail below, the Commission believes that even if regulatory burdens reduce the number of small broker-dealers in specialized segments, overall competition in those segments may not be harmed. See Section V.G.1, infra.

⁸³³ 17 CFR 242.613(c).

⁸³⁴ In the Adopting Release for Exchange Act Rule 613, the Commission stated that the data recording and reporting procedures are reasonably designed “to ensure that the [CAT] will be designed in a way that provides regulators with the accurate, complete, accessible, and timely market activity data they need for robust market oversight.” See Adopting Release, supra note 14, at 45743.

regulated entities, and therefore, it is necessary that the Plan Processor deal directly with CAT Reporters in determining matters related to reporting CAT Data.⁸³⁵

2. Format

The CAT NMS Plan does not mandate the format in which data must be reported to the Central Repository.⁸³⁶ Rather, the Plan provides that the Plan Processor will determine the electronic format in which data must be reported, and that the format will be described in the Technical Specifications.⁸³⁷

Two commenters expressed support for allowing the Plan Processor to determine the format for reporting data.⁸³⁸ One of these commenters stated that prescribing an approach in the Plan may hinder scalability and future system development.⁸³⁹

Three commenters, however, recommended that the format be specified in the Plan.⁸⁴⁰ One commenter argued that mandating an approach in the Plan, rather than waiting for the

⁸³⁵ The Commission notes that the CAT NMS Plan also requires the Plan Processor to measure and monitor latency within the CAT. See CAT NMS Plan, supra note 5, at Appendix D, Section 8.3.

⁸³⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section D.12(f); see also id. at Appendix C, Section A.1(a). The CAT NMS Plan states that CAT Reporters could be required to report data either in a uniform electronic format, or in a manner that would allow the Central Repository to convert the data to a uniform electronic format, for consolidation and storage. Id. at Appendix C, Section A.1(b).

⁸³⁷ Id. at Appendix D, Section 2.1. Appendix D states that more than one format may be allowed to support the various market participants that would report information to the Central Repository. Id.; see also id. at Section 6.9.

⁸³⁸ ICI Letter at 13.

⁸³⁹ Data Boiler Letter at 9. This commenter also stated that the formatting procedures in the Plan were insufficient and recommended using an audio/musical approach. Id. at 18.

⁸⁴⁰ FIF Letter at 90–92; FIX Trading Letter at 1; Better Markets Letter at 7 (stating that “the Commission should mandate the most widely used, open-sourced, machine-readable data format possible.”)

Technical Specifications, would give the industry more time to develop approaches to reporting using that format.⁸⁴¹ The commenter also argued that if the format is not known until the Technical Specifications are published, this would limit the opportunity to make changes to the format, if necessary, without disrupting the implementation schedule.⁸⁴² The commenter suggested that at least guidelines for a messaging protocol be included in the Plan.⁸⁴³

Commenters also expressed opinions about whether the Plan Processor should allow CAT Reporters to use multiple formats or one uniform format to report CAT Data. Four commenters generally supported an approach that would allow CAT Reporters to report CAT Data using a non-uniform format.⁸⁴⁴ Under such an approach, the Central Repository would be responsible for normalizing the data into a uniform format to link and store the data. These commenters noted that CAT Reporters should be permitted to use any of the currently existing industry protocols widely used by industry participants, such as OATS, SWIFT or FIX.⁸⁴⁵ One commenter advocated for the use of its own electronic communications protocol, FIX, stating that it would result in quicker implementation times and simplify data aggregation.⁸⁴⁶ This commenter noted that FIX is currently used by thousands of firms in the financial services

⁸⁴¹ FIF Letter at 90–91.

⁸⁴² Id. at 90.

⁸⁴³ Id. at 91-92.

⁸⁴⁴ FIF Letter at 90–92; ICI Letter at 13; FIX Trading Letter at 1–2; Data Boiler Letter at 41.

⁸⁴⁵ ICI Letter at 13; FIX Trading Letter at 1–2; Data Boiler Letter at 41; FIF Letter at 91. FIF stated that CAT Reporters could use either an existing format or a “native” format developed by the Plan Processor. Another commenter was against trying to develop a native CAT format. Data Boiler Letter at 20. This commenter suggested preserving data in its most original format and then converting trade streams into “music formats” for ease of storage and comparison and to facilitate surveillance. Id.

⁸⁴⁶ FIX Trading Letter at 1–2.

industry and that it would not make sense to require firms to convert from a FIX format to a proprietary format designed by the Plan Processor and mandated for CAT reporting.⁸⁴⁷ The commenter stated that FIX already tracks the lifecycle of an order both within an organization and across organizations, thus making it good choice as the format for the CAT.⁸⁴⁸ It also noted that it is used globally and can be used for products beyond listed options and equities. Finally, the commenter represented that FIX can handle any identifier, including LEI, and can support the CAT NMS Plan's use of Customer-ID, average price processing, options reporting, and the daisy chain approach for reporting.⁸⁴⁹

One commenter stated that while mandating one uniform format would reduce the burden on the Central Repository for consolidating and storing data, it would impose a burden on CAT Reporters to accurately translate their current reporting format into a uniform CAT interface that could result in more errors than if the conversion to a uniform format occurred at the Central Repository.⁸⁵⁰ Conversely, another commenter cautioned that requiring one uniform format would create a monopoly.⁸⁵¹

One commenter argued that while data reported in a non-uniform format can be reliably converted into a uniform format, there are benefits to using a uniform format.⁸⁵² Specifically, the commenter stated that using a uniform format can reduce data integrity issues within the Plan Processor, reduce data processing times, lower error correction rates between T+1 and T+3,

⁸⁴⁷ Id. at 1; see also FIF Letter at 92.

⁸⁴⁸ FIX Trading Letter at 2.

⁸⁴⁹ Id. at 2–3.

⁸⁵⁰ FIF Letter at 92.

⁸⁵¹ Data Boiler Letter at 36, 41.

⁸⁵² UnaVista Letter at 2.

reduce time and resources needed to on-board participants, and improve data accuracy and consistency across broker-dealers.⁸⁵³ The commenter also stated that use of a uniform format would improve data completeness because exact fields and standards would be defined.

In their response, the Participants stated that they do not believe that the Plan should mandate a specific format for reporting to the Central Repository, but rather should allow the Bidders to use discretion in selecting the format that will work most efficiently with their solution.⁸⁵⁴ The Participants stated that the nature of data ingestion is key to the architecture of the CAT and therefore the Plan does not mandate a data ingestion format, but allows the Plan Processor to determine the format.⁸⁵⁵ The Participants also noted that the remaining three Bidders propose accepting existing messaging protocols (e.g., FIX), rather than requiring CAT Reporters to use a new format.⁸⁵⁶ The Participants stated that when they evaluate each Bidder's solution, they will consider whether the Bidder's proposed approach for a message format is easily understood and adoptable by the industry. The Participants also stated that they will take into consideration each Bidder's ability "to reliably and accurately convert data to a uniform electronic format for consolidation and storage, regardless of the message formats in with the CAT Reporters would be required to report data to the Central Repository."⁸⁵⁷

The Commission believes it is reasonable to allow the Plan Processor to determine the electronic format in which data must be reported, and whether the format is uniform or whether

⁸⁵³ Id.

⁸⁵⁴ Response Letter I at 29.

⁸⁵⁵ Response Letter III at 14.

⁸⁵⁶ Id.

⁸⁵⁷ Response Letter I at 29.

multiple formats can be used to report CAT Data. The Commission recognizes that if a format were mandated in the CAT NMS Plan, CAT Reporters would have the information necessary to accommodate the format sooner than if they need to wait for the Plan Processor to choose the format. Although the Commission recognizes the benefit of early notice, mandating a particular format(s) in the Plan could limit the Plan Processor's options for designing the operation of the CAT as envisioned. Moreover, the Commission notes that the Participants have stated that they will consider whether a Bidder has proposed a format that is easily understood and adoptable by the industry.⁸⁵⁸ Further, because the Plan contemplates there will be iterations of the Technical Specifications, as well as time between publication of the Technical Specifications and the time by which data reporting must begin, the Commission believes that Industry Members will have sufficient time to comply with the ultimate format chosen by the Plan Processor. Therefore, the Commission believes that, rather than mandating the decision regarding the format for reporting in the CAT NMS Plan, it is reasonable for the format to be determined by the Plan Processor as a component of the CAT design.

3. Reporting Timelines

The CAT NMS Plan provides that CAT Reporters must report order event and trading information into the Central Repository by 8:00 a.m. ET on the Trading Day following the day the CAT Reporter records such information.⁸⁵⁹ A CAT Reporter must report post-trade information by 8:00 a.m. ET on the Trading Day following the day the CAT Reporter receives

⁸⁵⁸ Id.

⁸⁵⁹ See CAT NMS Plan, supra note 5, at Sections 6.3, 6.4.

such information.⁸⁶⁰ The CAT NMS Plan provides that CAT Reporters may voluntarily report Participant Data prior to the 8:00 a.m. ET deadline.⁸⁶¹

Commenters expressed opinions about the timeframe in which data should be reported by CAT Reporters to the Central Repository. One commenter expressed general support for the proposed reporting deadline, but noted that without having detailed Technical Specifications and validation rules, it could not assess the feasibility of meeting this deadline.⁸⁶² The commenter stated that more information is needed regarding the CAT data reporting requirements to determine whether collating and formatting for the required data fields is achievable within the deadlines.⁸⁶³

In contrast, two commenters suggested that data should be reported in real-time, or near real-time, rather than at 8:00 a.m. ET the Trading Day following the day that the data was recorded.⁸⁶⁴ One commenter noted under the CAT NMS Plan's reporting deadlines, if a trade were completed at 9:30 a.m. ET on a Friday on an exchange, it would not have to be reported until Monday at 8:00 a.m. ET.⁸⁶⁵ The commenter stated that the CAT NMS Plan does not present a convincing reason for the 8:00 a.m. ET deadline given that market participants have

⁸⁶⁰ See id. at Section 6.4. Post-trade information includes: (1) if an order is executed in whole or part: (a) an Allocation Report; (b) SRO-Assigned Market Participant Identifier of the clearing broker or prime broker, if applicable; and (c) CAT-Order-ID of any contra-side order(s); (2) if the trade is cancelled, a cancelled trade indicator; and (3) for original receipt or origination of an order, the Firm Designated ID, Customer Account Information, and Customer Identifying Information for the relevant Customer.

⁸⁶¹ See id. at Sections 6.3, 6.4.

⁸⁶² UnaVista Letter at 2.

⁸⁶³ Id.

⁸⁶⁴ Data Boiler Letter at 18; Better Markets Letter at 6.

⁸⁶⁵ Better Markets Letter at 6.

access to the data in real-time and should be able to report it in seconds or less.⁸⁶⁶ The commenter opined that real-time, or near real-time, reporting would allow for more robust surveillance and a “quicker reaction time.”⁸⁶⁷ Another commenter argued that data should be reported within 50 milliseconds so that regulators can conduct real-time surveillance.⁸⁶⁸ The commenter recommended that CAT support real-time ingestion, processing and surveillance.⁸⁶⁹

This commenter also questioned the Plan Processor’s ability to receive data from all CAT Reporters at 8:00 a.m. ET, and suggested that receiving data in real-time would alleviate any potential problems in this regard.⁸⁷⁰ Another commenter also addressed concerns regarding CAT’s capacity if a significant number of CAT Reporters choose to submit data at or around the same time, and recommended that the Plan Processor model its methodology on a system that has proven it can successfully project and manage large amounts of data, such as the Options Price Reporting Authority (“OPRA”).⁸⁷¹

In response to these comments, the Participants noted that the Commission considered the idea of requiring real-time reporting in Rule 613, but instead imposed a reporting deadline of 8:00 a.m. ET.⁸⁷² Therefore, the Participants are not required to file a plan containing real-time

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Id.

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Id.

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Data Boiler Letter at 19.

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Id. at 1. This commenter suggested that if CAT Data was going to be reported in real-time, SIP data should also be reported in real-time. See Data Boiler Letter at 42. Because the Commission does not believe that real-time reporting should be mandated by the Plan, the commenter’s suggestion that SIP data be reported in real-time if CAT Data is going to be reported in real-time, is moot.

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Id. at 19–20.

871

FIF Letter at 125.

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See Adopting Release, supra note 14, at 45765.

reporting.⁸⁷³ Further, in response to the commenter that stated that real-time, or near real-time, reporting would assist with surveillance and early warning of market events,⁸⁷⁴ the Participants noted that certain of them already have real-time surveillance tools in place that will not be affected by the implementation of the CAT.⁸⁷⁵

As the Participants noted, the Commission considered whether CAT Reporters should be required to report data in real-time when it adopted Rule 613 under Regulation NMS.⁸⁷⁶ In response to the Proposing Release which proposed that data be collected in real-time, commenters questioned the accuracy, cost, and usability of data reported in real-time.⁸⁷⁷ The Commission concluded that there were practical advantages to taking a more gradual approach for an undertaking such as the CAT, and acknowledged that while there might be certain advantages to receiving data intraday, the greater majority of benefits to be realized from development of the CAT do not require real-time reporting.⁸⁷⁸ Further, the Commission recognized that not requiring real-time reporting upon implementation would result in significant cost savings for industry participants.⁸⁷⁹ After reviewing the CAT NMS Plan and considering the commenters' statements, the Commission continues to adhere to that view.

⁸⁷³ See 17 CFR 242.613(c)(3). See Adopting Release, supra note 14, at 45765. Indeed, Rule 613 stated that the CAT NMS Plan may not impose a reporting deadline earlier than 8:00 a.m. ET on the Trading Day after the trade date. 17 CFR 242.613(c)(3).

⁸⁷⁴ Better Markets Letter at 6.

⁸⁷⁵ Response Letter I at 31, 43.

⁸⁷⁶ See Adopting Release, supra note 14, at 45765.

⁸⁷⁷ Id. at 45768–69.

⁸⁷⁸ Id. at 45768.

⁸⁷⁹ Id. at 45769.

Further, in response to the commenter that questioned the feasibility of reporting data by the 8:00 a.m. ET reporting deadline without having detailed Technical Specifications and validation rules,⁸⁸⁰ the Commission notes that this reporting deadline is the same as that currently required for OATS reporting. Therefore, while again acknowledging the importance of timely delivery of Technical Specifications, the Commission believes many CAT Reporters already have the capability to report in compliance with the deadline proposed in the Plan and that such deadline is reasonable.

Additionally, in response to the commenter that questioned the Plan Processor's ability to simultaneously receive data from all CAT Reporters at 8:00 a.m. ET and suggested that receiving data in real-time would alleviate potential problems resulting from an influx of all the data at one time, the Commission notes that the CAT NMS Plan requires the Plan Processor to have the capacity to handle two times the historical peak daily volume to ensure that, if CAT Reporters choose to submit data all at one time, the Plan Processor can handle the influx of data.⁸⁸¹ Furthermore, because CAT Reporters have the option to report data throughout the day, the Commission anticipates that CAT Reporters, consistent with certain reporting practices, such as OATs reporting, will stagger their reports, thus alleviating concerns that a flurry of activity shortly before the 8:00 a.m. ET deadline would impose unnecessary burdens on the Plan Processor.

⁸⁸⁰ UnaVista Letter at 2.

⁸⁸¹ See CAT NMS Plan, supra note 5, at Appendix C, Section A.1.(a).(ii).

4. Data Elements

The CAT NMS Plan requires that numerous data elements be reported to the Central Repository to ensure there is sufficient information to create the lifecycle of an order, and provide regulators with sufficient detail about an order to perform their regulatory duties.

The Commission received a number of comments regarding specific data elements that CAT Reporters are required to report to the Central Repository. In addition, one commenter questioned generally if the SEC should reconsider the scope of Rule 613 and “ask whether a more broad and complete audit trail is really what regulators need to efficiently and effectively perform their duties.”⁸⁸² This commenter also questioned whether the data being captured is “relevant to achieve the SEC’s goals, or whether the data is being collected for statistical purposes and would simply overwhelm usability of the audit trail.”⁸⁸³

The Commission continues to believe that the overall scope of Rule 613 is appropriate. However, the Commission has considered comments on each data element contained in the CAT NMS Plan and its necessity to achieving the goal of creating a consolidated audit trail, and has determined to amend or eliminate certain of the requirements proposed in the CAT NMS Plan as detailed below.

a. Customer-ID

(1) Customer Information Approach

Article VI of the CAT NMS Plan adopts the “Customer Information Approach” for creating and utilizing a Customer-ID and identifying a Customer, which reflects the exemptive

⁸⁸² Anonymous Letter I at 1.

⁸⁸³ Id. at 3.

relief granted by the Commission.⁸⁸⁴ Several commenters expressed general support for the Customer Information Approach.⁸⁸⁵ Two commenters, however, requested a modification to the Customer Information Approach to permit Customer Identifying Information and Customer Account Information to be reported as part of the “customer definition process”⁸⁸⁶ instead of upon the original receipt or origination of an order.⁸⁸⁷ One of these commenters also stated that this modification would improve the security of Customer Account Information and the CAT because sensitive customer PII data “would not need to [be] passed to order management systems or stored with the firm’s CAT Reporting systems, but would remain with Customer Information Repositories which would issue the ‘Customer definition’ CAT Report.”⁸⁸⁸ One commenter stated that a unique identifier for every client may not be necessary and a unique identifier could be applied to only those with a certain threshold of trading activity.⁸⁸⁹ Another commenter expressed general support for the Customer Information Approach, but suggested that the CAT system should tag related trade patterns with each identifiable customer and counterparties as a “fingerprint (unique ID) to a customer and/or counterparty.”⁸⁹⁰

⁸⁸⁴ See Exemptive Request Letter, supra note 21, at 8–18; see also Section III.15, supra.

⁸⁸⁵ FIF Letter at 9–10, 67–72; Data Boiler Letter at 22–24; TR Letter at 8; see also UnaVista Letter at 3; DAG Letter at 2; STA Letter at 1 (supporting the DAG Letter’s Exemptive Request Letter recommendations).

⁸⁸⁶ Under the “customer definition process,” broker-dealers would submit an initial set of information identifying the Customer to the Central Repository.

⁸⁸⁷ FIF Letter at 9–10, 70–71; TR Letter at 8.

⁸⁸⁸ FIF Letter at 67; see also DAG Letter at 2; STA Letter at 1 (supporting the DAG Letter’s Exemptive Request Letter recommendations).

⁸⁸⁹ Anonymous Letter I at 3.

⁸⁹⁰ Data Boiler Letter at 23.

Several commenters commented on the specific data elements required to be reported under the Customer Information Approach. One commenter suggested that the definition of “account type” should be consistent with existing OATS definitions.⁸⁹¹ Another commenter noted that it could not find the definition of “customer type” in the CAT NMS Plan or Rule 613.⁸⁹² This commenter recommended using an existing field currently reported to the SROs or the SEC for “customer type” to minimize implementation effort.⁸⁹³ This commenter also stated that an individual’s “role in the account,” required to be reported as part of Customer Identifying Information, may not be consistently maintained across firms and that population and maintenance of this data field may be an issue.⁸⁹⁴ As a result, this commenter believed that the field for an individual’s role in the account should only be required to be reported when firms create new accounts after the implementation of reporting under the CAT.⁸⁹⁵

One commenter requested clarification that Industry Members would only be required to report CAT Data for “active” accounts, and then offered that “active accounts would be defined as those with activity in CAT reportable securities.”⁸⁹⁶ One commenter discussed whether Customer Identifying Information and Customer Account Information should be “refreshed” (i.e., updated) by an Industry Member. This commenter suggested “having the functional support for a voluntary full refresh, but...eliminat[ing] the mandated requirement to provide full refreshes periodically,” and stated that, “the initial load, daily updates and standard error

⁸⁹¹ TR Letter at 9.

⁸⁹² Id.

⁸⁹³ Id.

⁸⁹⁴ Id. at 10.

⁸⁹⁵ Id.

⁸⁹⁶ FIF Letter at 10.

processing should be sufficient to maintain data integrity.”⁸⁹⁷ This commenter added that while eliminating the periodic refresh of the information used to identify a Customer “may slightly reduce the burden or cost on the broker-dealer community as well as the Plan Processor, it would eliminate the need for unneeded transmission and handling of sensitive PII data.”⁸⁹⁸

Another commenter noted the different data elements that identify a Customer under the Customer Information Approach and recommended that “customer information fields be categorized based on degree of importance for market surveillance and market reconstruction, so that focus can be concentrated on ensuring accuracy of the most important fields from a surveillance viewpoint.”⁸⁹⁹ This commenter added that “[d]ifferent criteria could be established based on the customer data categorization for correction turn-around time; e.g., customer unique identifier (LTID or social security number) would be of highest priority; zip code may be of lesser importance and not impact regulators’ ability to surveil the marketplace.”⁹⁰⁰ This commenter requested clarification whether only “active” accounts are required to report customer identifying information as part of the customer definition process.⁹⁰¹

One commenter opposed the Customer Information Approach. This commenter stated that the Commission should require “a universal customer ID to aid in the accuracy, integrity,

⁸⁹⁷ Id. at 122.

⁸⁹⁸ Id. at 93.

⁸⁹⁹ Id.

⁹⁰⁰ Id.

⁹⁰¹ Id. at 10.

and consolidation of CAT Data” and that “[f]irm-based IDs will significantly increase the complexity and fragmentation of the dataset, slowing down consolidation.”⁹⁰²

According to the Participants, the Customer Information Approach would not have an adverse effect on the various ways in which, and purposes for which, regulators would use, access, and analyze the audit trail data reported under Rule 613 nor would it compromise the linking of order events, alter the time and method by which regulators may access the data, or limit the use of the CAT audit trail data. The Participants noted the unique nature of the existing identifiers to be used under the Customer Information Approach, which would allow the Plan Processor to create customer linkages with the same level of accuracy as the Customer-ID. The Participants also stated that the reliability and accuracy of the data reported to the Central Repository under the Customer Information Approach is the same as under the approach outlined in Rule 613 with regard to Customer-IDs because the identifiers used under the proposed Customer Information Approach are also unique identifiers. In some cases, the Participants stated that the Customer Information Approach may result in more accurate data, as errors may be minimized because broker-dealers will not have to adjust their systems to capture and maintain the additional Customer-ID data element, and only a single entity will have to perform the mapping of firm-designated account information to Customer-ID. The Participants also noted that a universal identifier that is tied to personally identifiable information could create a substantial risk of misuse and of possible identify theft as the universal identifiers are passed between the Plan Processor and each CAT Reporter.

⁹⁰² Better Markets Letter at 9.

The Participants further argued that the benefits of the Customer Information Approach outweigh any potential disadvantages.⁹⁰³ The Participants added that based upon their analysis of this issue and discussions with the industry, as detailed in the Exemptive Request Letter and the Plan, the Participants disagree that the Customer Information Approach will increase complexity or slow down consolidation. The Participants stated that utilizing a single Customer-ID within the CAT while allowing firms to report using existing identifiers would substantially reduce costs and speed implementation without limiting the regulatory use of the data. Indeed, the Participants noted that the additional cost required to comply with the Customer-ID approach set forth in the Rule, rather than with the Customer Information Approach as proposed in the CAT NMS Plan, would be at least \$195 million for the largest CAT Reporters.⁹⁰⁴

The Participants clarified in their response at what point Customer Account Information and Customer Identifying Information must be reported under the Plan.⁹⁰⁵ The Participants stated that the approach discussed in the Exemptive Request Letter was intended to require CAT Reporters to supply Customer Identifying Information and Customer Account Information as part of the customer definition process—that is, prior to the origination or original receipt of an order—rather than as information submitted with each order. The Participants noted that Section 6.4(d)(iv) of the Plan describes this customer definition process, which includes the process for submitting customer information and for assigning Customer-IDs for use within the CAT. According to the Participants, the operation of Sections 6.3(d)(i) and 6.4(d)(i) of the Plan clarify that a CAT Reporter is required to submit the Firm Designated IDs with the new order reports,

⁹⁰³ Response Letter I at 33.

⁹⁰⁴ See Exemptive Request Letter, supra note 21, at 17.

⁹⁰⁵ Response Letter I at 34.

but not the information to identify a Customer. The Participants recognized, however, that the language in Section 6.4(d)(ii)(C) of the Plan could be read to suggest that the customer identifying information must be provided with each new order report (i.e., that the Customer Account Information and Customer Identifying Information must be submitted contemporaneously with each order, rather than submitting such information pursuant to the customer definition process). The Participants proposed that the CAT NMS Plan be amended to make clear that customer information would be submitted pursuant to the customer definition process rather than with each original receipt or origination of an order.

The Participants also noted that they do not believe that trading activity thresholds with respect to identifiers would be consistent with the requirements of Rule 613.⁹⁰⁶ The Participants stated that the use of unique IDs is essential to the effectiveness and usefulness of the CAT because these data elements will help regulatory users conduct surveillance across market centers and identify activity originating from multiple market participants.

In their response, the Participants stated that they have not yet determined how “account type” and “customer type” will be defined for purposes of reporting to the Central Repository and anticipate that they will be defined in the Technical Specifications.⁹⁰⁷

With respect to limiting the reporting of a Customer’s “role in the account” on a going-forward basis (i.e., after implementation of the CAT), the Participants stated that the Plan does not distinguish between legacy and new accounts with regard to this requirement and the Participants do not believe that this change is necessary.⁹⁰⁸

⁹⁰⁶ Id. at 23.

⁹⁰⁷ Id. at 24.

⁹⁰⁸ Id. at 23.

The Participants stated in their response that the CAT NMS Plan currently anticipates that Industry Member CAT Reporters would only report information to identify a customer for “active accounts” as part of the customer definition process.⁹⁰⁹ Specifically, the Plan states that “broker-dealers will initially submit full account lists for all active accounts to the Plan Processor and subsequently submit updates and changes on a daily basis,”⁹¹⁰ and defines “active accounts” as “accounts that have had activity within the last six months.”⁹¹¹ Moreover, the Participants noted that the Plan states that “[t]he Participants anticipate that Customer information that is initially reported to the CAT could be limited to only customer accounts that have, or are expected to have, CAT-reportable activity. For example, accounts that are considered open, but have not traded Eligible Securities in a given timeframe may not need to be pre-established in the CAT, but rather could be reported as part of daily updates after they have CAT-reportable activity.”⁹¹² Accordingly, the Participants suggested that the CAT NMS Plan be amended to clarify that only active accounts are required to report Customer Identifying Information during the customer definition process.

With respect to the Plan’s requirement to periodically refresh Customer Identifying Information and Customer Account Information, the Participants stated in their response that they believe that maintaining the accuracy of customer information is vital to the operation of the CAT.⁹¹³ Therefore, the Participants noted that a periodic refresh of customer information is

⁹⁰⁹ Id. at 35.

⁹¹⁰ Id. at 22 (citing the CAT NMS Plan, Appendix C, Section A.1(a)(iii)).

⁹¹¹ Id. (citing the CAT NMS Plan, Appendix C, Section A.1(a)(iii), n.39).

⁹¹² Id. (citing the CAT NMS Plan, Appendix C, Section A.1(a)(iii), n.36).

⁹¹³ Id. at 31.

beneficial because it will help to ensure that all customer information remains accurate and up to date. The Participants further acknowledged the concern with maintaining the confidentiality of PII and other CAT Data.⁹¹⁴ To that end, the Participants highlighted Section 6.12 of the Plan, which requires the Plan Processor to develop and maintain a comprehensive information security program that meets certain requirements set forth in the Plan, and the fact that the information security program must be approved and reviewed at least annually by the Operating Committee. The Participants stated that they continue to assess the Bidders' proposed security solutions and believe that once the CAT is operational the information security program will address the commenters' concerns regarding data security. Finally, the Participants noted that the Plan will define the scope of a "full" customer information refresh and the extent to which inactive or other accounts would need to be reported.⁹¹⁵

The Participants further stated that they do not agree that it would be appropriate to rank the importance of particular data elements reported to the Central Repository for data correction or other purposes for several reasons.⁹¹⁶ First, the Participants pointed out that Rule 613 does not indicate that any data elements are more or less important for market surveillance or market reconstruction purposes. The Participants noted that Rule 613(c)(7) states that the Plan "shall require each national securities exchange, national securities association, and any member of such exchange or association to record and electronically report to the central repository details for each order and each reportable event, including, but not limited to [the information set forth in Rule 613(c)(7)(i)–(viii)]" (emphasis added). Second, the Participants noted that ranking the

⁹¹⁴ Id. at 32.

⁹¹⁵ Id.

⁹¹⁶ Id.

importance of data elements for market surveillance and market reconstruction purposes might inappropriately reveal the confidential, proprietary surveillance processes used by each Participant. Third, the Participants stated that with respect to data accuracy, the Participants have included provisions in the Plan to take into account minor and major inconsistencies in Customer information. In particular, the Participants noted that Appendix D explains that “[t]he Plan Processor must design and implement procedures and mechanisms to handle both minor and material inconsistencies in Customer information.”⁹¹⁷ Additionally, material inconsistencies must be communicated to the submitting CAT Reporter(s) and resolved within the established error correction timeframe, as detailed in Sections 6–7 of Appendix D of the Plan.⁹¹⁸ The Participants stated that the Central Repository also must have an audit trail showing the resolution of all errors.⁹¹⁹ Finally, the Participants noted that they intend to monitor errors in the customer information fields and will consider, as appropriate, whether to prioritize the correction of certain data fields over others.

The Commission believes that the clarification provided by the Participants that Customer Account Information and Customer Identifying Information are reported as part of the customer definition process, rather than with each original receipt or origination of an order, is reasonable. The Commission believes that this will clarify the process for submitting information to identify a Customer under the CAT NMS Plan and will remove any ambiguity as to the reporting responsibilities of Industry Members. The Commission further believes that this clarification also will reduce the prospect of

⁹¹⁷ Id. at 22 (citing the CAT NMS Plan at Appendix D, Section 9.4).

⁹¹⁸ Id.

⁹¹⁹ Id.

unnecessarily passing sensitive customer PII data. Accordingly, the Commission is amending Section 6.4(d)(ii)(C) of the CAT NMS Plan to clarify that Customer Identifying Information and Customer Account Information will be reported as part of the Customer definition process, rather than upon original receipt or origination of an order.

The Commission also agrees that creating a unique Customer-ID as contemplated by the CAT NMS Plan, regardless of the Customer's trading activity threshold, is reasonable. The Commission notes that surveillance and enforcement efforts are necessary, even for accounts with low levels of trading activity.

The Commission further believes that it is reasonable to allow the Plan Processor, in conjunction with the Operating Committee, to define the specific "account types" and "customer types" in the Technical Specifications for the CAT NMS Plan. This approach will allow the Plan Processor to assess the various definitions of "account type" and "customer type" that exist among the CAT Reporters, and then make a determination as to how to appropriately classify them for purposes of CAT reporting. The Commission expects the Plan Processor will define these terms with sufficient precision so that the reporting requirements will be clear.

The Commission agrees that a Customer's role in the account should be a data element that is reported as part of the customer definition process, regardless of whether the account existed prior to implementation of the CAT or was created thereafter. The CAT NMS Plan does not distinguish between legacy and new accounts, for purposes of reporting Customer Identifying Information, and the Commission believes identifying the Customer's role in the account will facilitate surveillance and enforcement efforts.

The Commission also believes that it is reasonable to limit the reporting of Customer Identifying Information and Customer Account Information to only those accounts that are

“active,” defined as a Customer account that has had activity (i.e., received or originated an order), in an Eligible Security within the last six months. This will alleviate the need for CAT Reporters to update the Customer Identifying Information or Customer Account Information for accounts that have not received or originated an order for more than six months, but still ensures that the Central Repository will collect audit trail data for Customer accounts that have any Reportable Events. The Commission notes that pursuant to the Plan and the Customer Information Approach, a CAT Reporter must upload any Customer Identifying Information and Customer Account Information to the Central Repository prior to a Customer originating an order. Because of this requirement, even if a CAT Reporter has not been updating the Customer Identifying Information and Customer Account Information for a Customer with an account with no Reportable Events for six months, if the Customer decides to submit or originate an order, the CAT Reporter would upload the required information identifying the Customer on the same day the Customer submits the order, and upon submission of the order, the Central Repository will collect the audit trail data required by Section 6.4 of the Plan. Accordingly, the Commission is amending Section 1.1 of the CAT NMS Plan to add a definition of “Active Accounts” to mean an account that has received or originated an order in an Eligible Security within the last six months. In addition, the Commission will amend Section 6.4(d)(iv) of the Plan to require that Industry Members submit an initial set of Customer Identifying Information and Customer Account Information to the Central Repository only for Active Accounts; and require Industry Members to update Customer Identifying Information and Customer Account Information only for Active Accounts.

The Commission also believes that it is reasonable for the CAT NMS Plan to require the periodic refresh of such information to ensure that the Central Repository has the most current

information identifying a Customer. The Commission notes that both daily updates and periodic refreshes will require the uploading of PII, along with other CAT Data, to the Central Repository, but believes that the robust information security program to be implemented and maintained by the Plan Processor should sufficiently protect all CAT Data.⁹²⁰

(2) Modification or Cancellation of an Order

In connection with their proposal to adopt the Customer Information Approach, as discussed above, the Participants also suggested modification to Rule 613(c)(7)(iv)(F), which requires that “[t]he CAT-Reporter-ID of the broker-dealer or Customer-ID of the person giving the modification or cancellation instruction” be reported to the Central Repository.⁹²¹ In the CAT NMS Plan, the Participants proposed that CAT Reporters report whether a modification or cancellation instruction was given by the Customer associated with the order, or was initiated by the broker-dealer or exchange associated with the order.⁹²² According to the Participants, it is most critical for regulatory purposes to ascertain whether the modification or cancellation instruction was given by the Customer or was instead initiated by the broker-dealer or exchange, rather than capturing the identity of the specific person who gave the instruction.⁹²³

One commenter believed that modification and cancellation instructions are as important as other Reportable Events and, therefore, the identity of the person giving such instructions is

⁹²⁰ The Commission also finds it reasonable not to rank CAT data elements in terms of relative importance because importance of the CAT data elements will necessarily vary in accordance with the manner in which the data is used.

⁹²¹ 17 CFR 242.613(c)(7)(iv)(F) (emphasis added).

⁹²² See Exemption Request Letter, supra note 21, at 12.

⁹²³ Id.

“vital information for market surveillance purpose[s].”⁹²⁴ The commenter opposed the Participants’ approach of permitting CAT Reporters to report whether a modification or cancellation of an order was given by a Customer or initiated by a broker-dealer or exchange, in lieu of requiring the reporting of the Customer-ID of the person giving the modification or cancellation instruction.⁹²⁵

In their response, the Participants noted that reporting a single, specific Customer-ID for all modifications and cancellations is not possible under the Customer Information Approach because broker-dealers would not maintain Customer-IDs; instead, each broker-dealer would provide Firm-Designated IDs to the Central Repository to identify a Customer.⁹²⁶ The Participants also stated that requiring CAT Reporters to report the Customer-ID of the specific individual initiating a cancellation or modification would introduce an inconsistent level of granularity in customer information between order origination and order modifications or cancellations, because Rule 613(c)(7)(i) does not require the reporting of the specific individual originating an order.

The Commission has considered the commenter’s concern and the Participants’ response, and believes that requiring that CAT Reporters report whether a modification or cancellation instruction was given by the Customer associated with the order, or was initiated by the broker-dealer or exchange associated with the order, is a reasonable approach to providing useful audit trail data regarding the modification or cancellation of an order. The approach set forth in the Plan also will not result an inconsistent level of granularity between the Reportable Events of

⁹²⁴ Data Boiler Letter at 24 (responding to Question 161 of the Plan Proposing Release).

⁹²⁵ See CAT NMS Plan, *supra* note 5, at Section 6.3(d)(iv)(F).

⁹²⁶ Response Letter I at 24.

origination or receipt of an order, and the modification or cancellation of the order because it would not require the identity of the person that gave the modification or cancellation instruction—which is not required under the CAT NMS Plan nor Rule 613.

(3) Reporting an Account Effective Date

In connection with their proposal to adopt the Customer Information Approach, as discussed above, the Participants also proposed an alternative method for reporting the date an account was opened, as required by Rule 613(c)(7)(viii)(B).⁹²⁷ When reporting “Customer Account Information,” an Industry Member is required to report the date an account was opened.⁹²⁸ The SROs requested an exemption to allow an “effective date” be reported in lieu of an account open date in certain limited circumstances.⁹²⁹ As a result, an Industry Member will report the date an account was opened; except, however, that (a) in those circumstances in which an Industry Member has established a trading relationship with an institution but has not established an account with that institution, the Industry Member will (i) provide the Account Effective Date in lieu of the “date account opened”; (ii) provide the relationship identifier in lieu of the “account number”; and (iii) identify the “account type” as a “relationship”;⁹³⁰ and (b) in those circumstances in which the relevant account was established prior to the implementation date of the CAT NMS Plan applicable to the relevant CAT Reporter and no “date account opened” is available for the account, the Industry Member will provide the Account Effective

⁹²⁷ See September 2015 Supplement, supra note 21.

⁹²⁸ See CAT NMS Plan, supra note 5, at Section 1.1.

⁹²⁹ See September 2015 Supplement, supra note 21.

⁹³⁰ The Commission notes that because “account type” will be defined in the Technical Specifications for purposes of reporting to the Central Repository, one type of “account type” will be “relationship,” See Section IV.D.4.a(1), supra.

Date in the following circumstances: (i) where an Industry Member changes back office providers or clearing firms and the date account opened is changed to the date the account was opened on the new back office/clearing firm system; (ii) where an Industry Member acquires another Industry Member and the date account opened is changed to the date the account was opened on the post-merger back office/clearing firm system; (iii) where there are multiple dates associated with an account in an Industry Member's system, and the parameters of each date are determined by the individual Industry Member; and (iv) where the relevant account is an Industry Member proprietary account.⁹³¹ Several commenters supported the Participants' approach to reporting an account effective date rather than the date an account was opened, as set forth in the CAT NMS Plan, and which reflects the exemptive relief granted by the Commission.⁹³² The Commission believes that the CAT NMS Plan's approach to reporting an account effective date, rather than the date an account was opened, is reasonable and will not impact the quality or usefulness of the information available to regulators.

(4) Identifying a Customer using LEI

The Commission also received several comments stating that the Commission should mandate the use of LEIs whenever applicable.⁹³³ One commenter, also noting its support for using a global entity identifier in general and LEI specifically, stated that while it agrees that the system should provide for the capture and reporting of LEIs for customer identification, it would be appropriate to provide for a transitional approach to

⁹³¹ CAT NMS Plan, supra note 5, at Section 1.1.

⁹³² Data Boiler Letter at 24; TR Letter at 8; FIF Letter at 9, 81–83; see also Exemption Order, supra note 21.

⁹³³ Better Markets Letter at 8; DTCC Letter at 1; see also UnaVista Letter at 3 (supporting the use of LEIs in conjunction with other personal identifiers to identify Customers).

the collection of the LEIs. Under the commenter's recommended transitional approach, broker-dealers would provide the LEI to the CAT in each instance where the LEI is already known and collected.⁹³⁴ This commenter also believed that it would be important to establish the CAT in a way that captures the LEI as part of the initial implementation of the system, rather than having to adapt the system at a future date, and that use of LEIs is important for both risk management and operational efficiency.⁹³⁵ Another commenter, however, did not recommend that the LEI be mandated for use by broker-dealers and argued that mandating the use of LEIs would disadvantage small broker-dealers who have no business requirement at this time to use LEI.⁹³⁶

In their response, the Participants stated that based on discussions with the DAG, they agree with the commenters that it would be reasonable to require an Industry Member to report its LEI or the LEI of a Customer to the Central Repository as part of Customer Identifying Information if the Industry Member has or acquires an LEI.⁹³⁷ The Participants added that Industry Members that report LEIs would do so in addition to, rather than in lieu of, the other Customer Identifying Information required by the Plan.⁹³⁸ The Participants do not believe,

⁹³⁴ SIFMA Letter at 36.

⁹³⁵ Id. at 37; see also DTCC Letter at 2–4 (noting industry and regulatory support for LEIs and, that if LEIs were mandated, it would facilitate the ability for regulators to aggregate systemic risk exposures across markets).

⁹³⁶ FIF Letter at 70.

⁹³⁷ Response Letter II at 5–6.

⁹³⁸ Response Letter III at 12.

however, that the Plan should require Industry Members or others to obtain an LEI for a Customer if they do not already have one.⁹³⁹

The Participants further stated that, based on discussions with the DAG, they believe that Industry Members should be permitted to provide Customer LEIs in their possession without the imposition of any due diligence obligations beyond those that may exist today with respect to information associated with an LEI.⁹⁴⁰ The Participants noted that, although Industry Members should not be required to perform additional due diligence with regard to the LEIs for CAT purposes, Industry Members will be required to accurately provide the LEIs in their records and may not knowingly submit inaccurate LEIs to the CAT.⁹⁴¹ In addition, the Participants stated that all of the remaining Bidders have indicated that their solutions will be able to support the use of LEIs.⁹⁴² Moreover, although the Participants believed that there are costs related to requiring Industry Members to provide an LEI if they have one, the Participants believed that the benefits outweigh the costs.⁹⁴³

The Commission has considered the commenters' views on the merits of reporting an LEI to the Central Repository as part of Customer Identifying Information and the Participants' response and believes that it is reasonable to require an Industry

⁹³⁹ Response Letter II at 5.

⁹⁴⁰ Id.

⁹⁴¹ Id.

⁹⁴² Id. at 5-6.

⁹⁴³ The Participants do not believe that the proposed use of LEIs would reduce the granularity of information provided as the proposed use of LEIs would not change the provisions related to the SRO-Assigned Market Participant Identifiers (e.g., MPIDs). See CAT NMS Plan, supra note 5, at Sections 1.1 (definition of SRO-Assigned Market Participant Identifier), 6.3 (requiring reporting of SRO-Assigned Market Participant Identifier).

Member to report an LEI for its Customer if the Industry Member has or acquires the LEI for its Customer. Accordingly, the Commission is amending the definition of “Customer Identifying Information” in Section 1.1 of the Plan to require that an Industry Member report an LEI to identify a Customer that is a legal entity, if the Industry Member has or acquires the LEI of such Customer. However, the Commission is also making clear that the LEI is not reported in lieu of the other Customer Identifying Information for a legal entity (e.g., name, address, or employer identification number), but must be reported along with other Customer Identifying Information.

The Commission believes use of the LEI enhances the quality of identifying information for Customers by incorporating a global standard identifier increasingly used throughout the financial markets. The Commission notes that according to the Plan, Industry Members will still be required to report other Customer Identifying Information even if the Industry Member reports an LEI to identify a Customer; thus the LEI supplements the other information that will be used by the Central Repository to identify a Customer.

The Commission further believes that it is reasonable to not require an Industry Member to obtain an LEI for its Customer or for itself if the Industry Member does not already have an LEI for its Customer or itself because such a requirement would impose an additional burden. However, the Commission believes that requiring Industry Members to accurately provide the LEIs in their records and not knowingly submit

inaccurate LEIs to the CAT is reasonable, because reporting accurate information to the CAT is a fundamental requirement of the Plan.⁹⁴⁴

In response to the commenter that believed that such a requirement might disadvantage small broker-dealers, the Commission notes that the requirement to report LEIs does not mandate that a broker-dealer obtain an LEI to comply with the Plan; therefore, small broker-dealers that do not currently have an LEI will not be required to report one and thus will not be disadvantaged.

b. CAT-Reporter-ID

(1) Existing Identifier Approach

Article VI of the CAT NMS Plan reflects the “Existing Identifier Approach” for purposes of identifying each CAT Reporter associated with an order or Reportable Event.⁹⁴⁵ Under the Existing Identifier Approach, CAT Reporters are required to record and report to the Central Repository an SRO-Assigned Market Participant Identifier for orders and certain Reportable Events to be used by the Central Repository to assign a unique CAT-Reporter-ID to identify CAT Reporters. An Industry Member is required to report its existing SRO-Assigned Market Participant Identifier used by the relevant SRO specifically for transactions occurring on that SRO to the Central Repository.⁹⁴⁶ Similarly, an exchange reporting CAT Reporter information is required to report data using the SRO-Assigned Market Participant Identifier used by the Industry Member on that exchange or its systems.⁹⁴⁷ Off-exchange orders and Reportable

⁹⁴⁴ See CAT NMS Plan, supra note 5, at Section 6.5(d).

⁹⁴⁵ See id. at Section 6.3(e).

⁹⁴⁶ See Exemption Order, supra note 21, at 31–41.

⁹⁴⁷ See id. at 20.

Events will be reported with an Industry Member’s FINRA SRO-Assigned Market Participant Identifier.⁹⁴⁸

For the Central Repository to link the SRO-Assigned Market Participant Identifier to the CAT-Reporter-ID, each SRO will submit, on a daily basis, all SRO-Assigned Market Participant Identifiers used by its Industry Members (or itself), as well as information sufficient to identify the corresponding market participant (e.g. a CRD number or LEI) to the Central Repository.⁹⁴⁹ Additionally, each Industry Member will be required to submit to the Central Repository information sufficient to identify such Industry Member (e.g., CRD number or LEI, as noted above).⁹⁵⁰ The Plan Processor will use the SRO-Assigned Market Participant Identifiers and identifying information (i.e., CRD number or LEI) to assign a CAT-Reporter-ID to each Industry Member and SRO for internal use within the Central Repository.⁹⁵¹

The reporting of an existing SRO-Assigned Market Participant Identifier differs from Rule 613 in that under Rule 613(c)(8), CAT Reporters would be required to report a universal CAT-Reporter-ID for certain Reportable Events.⁹⁵² In the Exemptive Request Letter, the SROs

948

Id.

949

See CAT NMS Plan, supra note 5, at Section 6.3(e)(i).

950

Id. at Section 6.4(d)(vi).

951

See Exemption Order, supra note 21, at 31–41.

952

Rule 613(c)(8) requires that CAT Reporters use the same CAT-Reporter-ID for each broker-dealer. 17 CFR 242.613(c)(8). The Reportable Events for which CAT-Reporter-IDs must be reported are: the broker-dealer receiving or originating an order (17 CFR 242.613(c)(7)(i)(C)); the broker-dealer or national securities exchange from which (or to which) an order is being routed (17 CFR 242.613(c)(7)(ii)(D) and (E)); if the order is routed to a national securities association, then the CAT-Reporter-ID of that national securities association must be reported (17 CFR 242.613(c)(7)(ii)(E)); the broker-dealer or national securities exchange receiving (or routing) a routed order (17 CFR 242.613(c)(7)(iii)(D) and (E)); if a national securities association receives the routed order, then the CAT-Reporter-ID of that national securities association must be reported

requested an exemption to permit a CAT Reporter to report an existing SRO-Assigned Market Participant Identifier in lieu of requiring the reporting of a universal CAT-Reporter-ID.⁹⁵³ Specifically, the Participants stated that the Existing Identifier Approach would not negatively impact regulators' access, use, and analysis of CAT Data, and that it could allow additional levels of granularity compared to the universal CAT-Reporter-ID approach, in that SRO-Assigned Market Participant Identifiers may contain additional information not mandated by the CAT NMS Plan, such as the specific desk or department responsible for trades.⁹⁵⁴ The Participants also stated that they believe the reliability and accuracy of CAT Data under the Existing Identifier Approach would not be undermined,⁹⁵⁵ and represented that the Existing Identifier Approach could result in fewer errors and more reliable and accurate linkage of order information.⁹⁵⁶ Further, the Participants noted their belief – based upon discussion with the DAG – that the Existing Identifier Approach would reduce the cost and implementation burdens on CAT Reporters to comply with Rule 613,⁹⁵⁷ as it would allow them to continue using their current business practices and data flows instead of building new infrastructure to support the CAT-Reporter-ID requirement.⁹⁵⁸

(17 CFR 242.613(c)(7)(iii)(D)); the broker-dealer, if applicable, giving a modification or cancellation instruction, if an order is modified or cancelled (17 CFR 242.613(c)(7)(iv)(F)); the national securities exchange or broker-dealer executing an order, if an order is executed (17 CFR 242.613(c)(7)(v)(F)); and the clearing broker or prime broker, if applicable, if an order is executed (17 CFR 242.613(c)(7)(vi)(B)).

⁹⁵³ See Exemptive Request Letter, *supra* note 21, at 19.

⁹⁵⁴ See *id.* at 23, 26.

⁹⁵⁵ *Id.* at 23.

⁹⁵⁶ *Id.*

⁹⁵⁷ *Id.* at 21, 22, 24.

⁹⁵⁸ *Id.* at 24.

Several commenters expressed support for the Existing Identifier Approach.⁹⁵⁹ Two of the commenters listed benefits of the Existing Identifier Approach over the approach required in Rule 613.⁹⁶⁰ One of the commenters stated that the Existing Identifier Approach would be more efficient and cost-effective than the Rule 613 approach.⁹⁶¹ The other commenter listed the following benefits: the Existing Identifier Approach would allow the industry to keep its current business processes and identifiers; coordination of a single CAT-Reporter-ID to be used across all Participants to identify broker-dealers would not be necessary; CAT Reporters would not have to expand their information repositories to store and manage a new CAT-Reporter-ID; the Plan Processor would manage the translation between the SRO-Assigned Market Participant Identifiers and the CAT-Reporter-ID; since the Plan Processor would be assigning CAT-Reporter-IDs, CAT Reporters would not be subject to errors with respect to the application of CAT-Reporter-IDs; a common information technology solution would be used; the Existing Identifier Approach would allow regulators to surveil on a more granular level; and the Existing Identifier Approach would save CAT Reporters the expense of maintaining and supplying a unique CAT-Reporter-ID for every Reportable Event.⁹⁶² Both commenters stated that the Existing Identifier Approach would not affect the accuracy, accessibility, timeliness or security and confidentiality of CAT Data over the Rule 613 approach.⁹⁶³

⁹⁵⁹ See Data Boiler Letter at 22; FIF Letter at 73–74 ; TR Letter at 7–8; see also DAG Letter at 2; STA Letter at 1 (supporting the DAG Letter’s Exemptive Request Letter recommendations).

⁹⁶⁰ Data Boiler Letter at 22; FIF Letter at 73–74.

⁹⁶¹ Data Boiler Letter at 22.

⁹⁶² FIF Letter at 73–74.

⁹⁶³ Data Boiler Letter at 22; FIF Letter at 74.

Three commenters offered recommendations for modifying the Existing Identifier Approach.⁹⁶⁴ Two commenters asked that the FINRA MPID be permitted for non-execution reports.⁹⁶⁵ One commenter stated that, regardless of whether the Existing Identifier Approach or the Rule 613 approach is used, the CAT should “tag” trade patterns with the trading desk and trader.⁹⁶⁶

In response to the two commenters that requested that the FINRA MPID be used for non-execution reports,⁹⁶⁷ the Participants stated that the practices described by the two commenters would be acceptable under the Existing Identifier Approach, explaining that a broker-dealer CAT Reporter would be permitted to use any existing SRO-Assigned Market Participant Identifier (e.g., FINRA MPID, NASDAQ MPID, NYSE Mnemonic, CBOE User Acronym and CHX Acronym) when reporting order information to the Central Repository, regardless of the eventual execution venue.⁹⁶⁸

Based on the Participants’ representations in the Plan, the Commission believes that the Existing Identifier Approach is designed to provide the same regulatory benefits in terms of identifying CAT Reporters as would be achieved under Rule 613, at a reduced cost and implementation burden on CAT Reporters.⁹⁶⁹ The Existing Identifier Approach is designed to

⁹⁶⁴ Data Boiler Letter; TR Letter; FIF Letter.

⁹⁶⁵ TR Letter at 8–9; FIF Letter at 10–11.

⁹⁶⁶ Data Boiler at 22.

⁹⁶⁷ TR Letter at 8–9; FIF Letter at 10–11. The Participants did not respond to the comment suggesting the CAT should “tag” trade patterns with the trading desk and trader.

⁹⁶⁸ Response Letter I at 33.

⁹⁶⁹ According to the Participants, requiring the reporting of unique CAT-Reporter-IDs of: (i) the Industry Member receiving or originating an order; (ii) the Industry Member or Participant from which (and to which) an order is being routed; (iii) the Industry Member

link, within the Central Repository, all SRO-Assigned Market Participant Identifiers to the appropriate CAT-Reporter-ID, and ultimately to the CAT Reporter, in a manner that is efficient, accurate, and reliable.

The Commission notes that one commenter recommended that the CAT be able to link trades to the responsible trading desk and trader.⁹⁷⁰ The Commission notes that an additional benefit of the Existing Identifier Approach is that, as the Participants have represented, it may allow for the voluntary collection of additional levels of granularity, such as responsible trading desk or trader.⁹⁷¹

(2) Use of LEI

Section 6.3(e)(i) of the CAT NMS Plan requires each Participant to submit, on a daily basis, all SRO-Assigned Market Participant Identifiers used by its Industry Members or itself, as well as information to identify the corresponding market participant to the Central Repository, such as a CRD number or LEI, but does not require the reporting of LEIs. Section 6.4(d)(vi) of

or Participant receiving (and routing) a routed order; (iv) the Industry Member or Participant executing an order; and (v) the clearing broker or prime broker, would have imposed technical implementation difficulties on CAT Reporters and the Plan Processor alike to adopt the infrastructure to comply with the reporting, collection, and maintenance of CAT-Reporter-IDs. See Exemptive Request Letter, supra note 21, at 26. The Commission has considered the economic implications of the exemptive relief permitting the Existing Identifier Approach, as well as the other approaches in the CAT NMS Plan (options market maker quotes, Customer-ID, linking of executions to specific subaccount allocations on Allocation Reports, and timestamp granularity for Manual Order Events) that required exemptive relief from Rule 613 for inclusion in its economic analysis. See Notice, supra note 5, at 30709.

⁹⁷⁰ Data Boiler Letter at 22.

⁹⁷¹ See Exemptive Request Letter, supra note 21, at 23. Further, the Commission notes that Section 6.3(d)(ii)(F) of the CAT NMS Plan currently requires the reporting of the identity and nature of the department or desk to which an internally routed order is being routed, so the identity of a trading desk for internally routed orders will be captured through this provision.

the CAT NMS Plan requires each Industry Member to submit to the Central Repository information sufficient to identify such Industry Member, such as a CRD number or LEI, but similarly does not require the reporting of LEIs.

As discussed above in relation to the Customer-ID, several commenters recommended, or noted, the use of LEIs in lieu, or as part of the development of, a CAT-Reporter-ID.⁹⁷² One commenter stated that it supported requiring Industry Members to provide their LEIs, as long as LEIs are already being captured by their systems.⁹⁷³ Another commenter supported the optional use of LEIs, believing that mandatory use of LEIs would unfairly burden small broker-dealers that may not currently accommodate LEIs in their systems.⁹⁷⁴

In recognition of the comments that encouraged the use of LEIs in the CAT, and based on discussions with the DAG, the Participants have recommended that Sections 6.3(e)(i) and 6.4(d)(vi) of the CAT NMS Plan be amended to require a Participant to submit an Industry Member's LEI if the Participant has (or acquires) an LEI for an Industry Member, and to require Industry Members to submit to the Central Repository their LEIs if they have LEIs.⁹⁷⁵ This information will be reported to the Central Repository as part as the information the Plan Processor will use to assign CAT-Reporter-IDs.

The Commission considers the suggested modifications by the Participants to Section 6.3(e)(i) and Section 6.4(d)(vi) of the CAT NMS Plan to require the Participants and Industry Members to provide Industry Member LEIs, if known, by such Participant or Industry Member

⁹⁷² FIX Letter at 2; FIF Letter at 75, Data Boiler Letter at 22; DTCC Letter at 1–6.

⁹⁷³ Data Boiler Letter at 22.

⁹⁷⁴ FIF Letter at 11.

⁹⁷⁵ Response Letter II at 6; Response Letter III at 12.

to be reasonable and an improvement in the information available in the CAT with respect to CAT Reporters. Accordingly, the Commission is amending these sections to require the Participants and Industry Members to provide Industry Member LEIs, if known, by such Participant or Industry Member; however, the Commission is also amending these sections to require the submission of Participant LEIs, if a Participant has an LEI, as well as Industry Member CRD numbers. Specifically, the amendment to Section 6.3(e)(i) would require a Participant (i) for purposes of reporting information to identify itself pursuant to Section 6.3(e)(i), to submit its LEI to the Central Repository, if the Participant has an LEI; and (ii) for purposes of reporting information to identify an Industry Member pursuant to Section 6.3(e)(i), to submit the CRD number for the Industry Member, as well as the LEI of the Industry Member if the Participant has collected such LEI of the Industry Member. The amendment to Section 6.4(d)(vi) with respect to Industry Members would require an Industry Member, for purposes of reporting information to identify itself pursuant to Section 6.4(d)(vi), to submit to the Central Repository the CRD number of the Industry Member as well as the LEI of the Industry Member (if the Industry Member has an LEI).

The Commission believes these amendments are appropriate because they may enhance the quality of identifying information by requiring the submission of the LEI—a global standard identifier increasingly used throughout the financial markets—to the extent it has otherwise been obtained. Because the amendments only impose the requirement to report an LEI on Participants and Industry Members that currently have an LEI, and which is known by the CAT Reporter, it should not impose the additional burden on them to obtain an LEI. Further, the Participants have

represented that the Bidders' solutions can support the reporting of LEIs.⁹⁷⁶ Although Section 6.3(e)(i) and Section 6.4(d)(vi) currently permit the submission of CRD numbers, the Commission believes that requiring the submission of the Industry Member CRD numbers will provide regulators with consistent identifying information about Industry Members that is useful for regulatory investigations and has significant regulatory benefit. In addition, requiring CRD numbers to be provided should not impose additional burdens on Industry Members because, as registered broker-dealers, all Industry Members currently have CRD numbers.

c. Open/Close Indicator

Rule 613 and the CAT NMS Plan require CAT Reporters to report an open/close indicator as a "Material Term" on all orders.

Three commenters objected to the requirement that CAT Reporters report an open/close indicator for equities transactions.⁹⁷⁷ One of these commenters requested additional cost-benefit analysis on the open/close indicator.⁹⁷⁸ Another commenter argued that the open/close indicator should be reported for options only, noting that this indicator is not currently used for equities.⁹⁷⁹ Another commenter noted that including an open/close indicator for equities would require "significant process changes and involve parties other than CAT Reporters, such as buy-side clients, OMS/EMS vendors, and others."⁹⁸⁰ This commenter stated that, if the SROs and the Commission believe that there is value in obtaining the open/close indicator for surveillance

⁹⁷⁶ Response Letter II at 5–6.

⁹⁷⁷ TR Letter at 9; SIFMA Letter at 35–36; FIF Letter at 83–86.

⁹⁷⁸ FIF Letter at 84; see also SIFMA Letter at 36.

⁹⁷⁹ TR Letter at 9.

⁹⁸⁰ SIFMA Letter at 35.

purposes with respect to equities transactions, then a rule proposal covering this request and a thorough cost-benefit analysis should be filed for public comment.⁹⁸¹ Another commenter characterized the requirement to report an open/close indicator as a “market structure change” and likewise stated that the requirement should be subject to its own rulemaking process, including a cost-benefit analysis, and subject to a public comment period.⁹⁸²

In response, the Participants stated that they understand that Rule 613 requires that an “open/close indicator” be reported as part of the “material terms of the order” for both equities and options transactions, but recommended that CAT Reporters not be required to report an open/close indicator for equities transactions, or for options transactions, such as for market maker options transactions, in which the open/close indicator is not captured by current industry practice.⁹⁸³

The Commission notes that Rule 613(c)(2) states only that “the plan submitted pursuant to this section” (emphasis added) must require reporting of a set of “material terms of the order,” including an open/close indicator. It does not state that the Plan as *approved* must include that data element. Now that the Participants have submitted a plan in compliance with Rule 613, that rule does not preclude the Commission from approving a Plan that implements the Participants’ recommendation to limit the set of transactions to which the requirement to report an open/close indicator would apply. After consideration, the Commission believes that limiting the requirement to provide an open/close indicator to listed options is reasonable. The open/close indicator will provide important information about whether an order is opening or increasing a

⁹⁸¹ SIFMA Letter at 36; see also FIF Letter at 83–85.

⁹⁸² FIF Letter at 85.

⁹⁸³ Response Letter I at 22.

position in the option, or closing or reducing a position. While this information is useful with respect to non-market maker options activity, the Commission acknowledges the concerns in other areas, including the lack of a clear definition of the term for equities transactions, and the lack of utility of that data at the time of quote entry for options market makers.

Accordingly, as recommended by the Participants, the Commission is amending the Plan to remove the requirement that an open/close indicator be reported as part of the Material Terms of the Order for equities and Options Market Maker quotations.⁹⁸⁴

d. Allocations

(1) Use of Allocation Reports

The CAT NMS Plan requires that broker-dealers submit an Allocation Report following the execution of an order if such order is allocated to one or more accounts or subaccounts (the “Allocation Report Approach”). An Allocation Report must contain the following information: (i) the Firm Designated ID for any account(s), including subaccount(s), to which executed shares are allocated and the security that has been allocated; (ii) the identifier of the firm reporting the allocation; (iii) the price per share of shares allocated; (iv) the side of shares allocated; (v) the number of shares allocated to each account; and (vi) the time of the allocation.⁹⁸⁵

The Allocation Report Approach differs from Rule 613 in that under Rule 613(c)(7)(vi)(A), each CAT Reporter would be required to record and report to the Central Repository “the account number for any subaccounts to which the execution is allocated (in whole or part).”⁹⁸⁶ Under Rule 613 regulators would be able to link the subaccount to which an

⁹⁸⁴ “Material Terms of the Order” is defined in Section 1.1 of the CAT NMS Plan.

⁹⁸⁵ See CAT NMS Plan, *supra* note 5, at Section 1.1.

⁹⁸⁶ See 17 CFR 242.613(c)(7)(vi)(A).

allocation was made to a specific order. In contrast, under the Allocation Report Approach, regulators would only be able to link an allocation to the account to which it was made, and not to a specific order.

In the Exemption Request, the Participants represented that, based on discussions with the DAG, broker-dealer systems do not presently link orders with allocations of the resulting executions, and building such functionality would be complex and costly. In addition, the Participants stated that the Allocation Report Approach would not affect the various ways in which, and purposes for which, regulators would use, access, and analyze CAT Data.⁹⁸⁷ The Participants represented that the Allocation Report Approach would still provide regulators with the ability to associate allocations with the Customers that received them and would provide regulators with useful information without imposing undue burden on the industry.⁹⁸⁸ The Participants also stated that they do not believe that this approach would compromise the linking of order events, alter the time and method by which regulators may access the data, or limit the use of the data as described in the use cases contained in the Adopting Release for Rule 613.⁹⁸⁹

Moreover, the Participants stated that they, along with the industry, believe that linking allocations to specific executions, as mandated by Rule 613, would be artificial and would not otherwise serve a legitimate purpose.⁹⁹⁰ The Participants argued that because the Allocation Report Approach leverages existing business processes instead of creating new workflows, it could help improve the reliability and accuracy of CAT Data as well as reduce the time CAT

⁹⁸⁷ See Exemption Request, supra note 21, at 30.

⁹⁸⁸ See id.

⁹⁸⁹ Id.; see also Adopting Release, supra note 14, at 45798–99.

⁹⁹⁰ See Exemption Request, supra note 21, at 30.

Reporters need to comply with the CAT reporting requirements.⁹⁹¹ The Participants also stated that complying with the requirements of Rule 613(c)(7)(vi)(A) would require additional system and process changes which could potentially impact the reliability and accuracy of CAT Data.⁹⁹²

Four commenters expressed support for the Allocation Report Approach, noting that the approach would eliminate the need to re-engineer systems.⁹⁹³ One of the commenters stated that the information reported in an Allocation Report would provide regulators with sufficient information to link allocations through reference information to the Customer that placed the order, but noted that “there may not always be sufficient linkage information to relate a specific order, execution and allocation for a customer.”⁹⁹⁴ This commenter argued that it is not possible to link allocations to order lifecycles in the case of many-to-many orders.⁹⁹⁵

One commenter, however, disagreed with the Allocation Report Approach, stating that it would impact the completeness, accessibility and timeliness of CAT Data, and foreseeing challenges in linking the accounts and subaccounts to which an execution is allocated.⁹⁹⁶ This commenter believed that broker-dealers can, and should, track order allocation information, including in the case of many-to-many orders.⁹⁹⁷

⁹⁹¹ Id.

⁹⁹² Id.

⁹⁹³ See FIF Letter at 75–79; TR Letter at 8; see also DAG Letter at 2; STA Letter at 1 (supporting the DAG Letter’s Exemptive Request Letter recommendations).

⁹⁹⁴ FIF Letter at 78, 90.

⁹⁹⁵ Id. at 90.

⁹⁹⁶ Data Boiler Letter at 24–25.

⁹⁹⁷ Id. at 40.

In response to commenters, the Participants restated their belief that the Allocation Report Approach set forth in the CAT NMS Plan appropriately weights the costs and benefits, and that “linking allocations to executions could show artificial relationships between these order events.”⁹⁹⁸

The Commission believes that the Plan’s Allocation Report Approach will provide regulators the necessary information to detect abuses in the allocation process without imposing undue burdens on broker-dealers. The use of Allocation Reports will provide the Central Repository the ability to efficiently, accurately, and reliably link the subaccount holder to those with authority to trade on behalf of the account, which will ultimately improve regulatory efforts by SROs and the Commission, including market surveillance, market reconstructions, enforcement investigations, and examinations of market participants.⁹⁹⁹ Additionally, by leveraging existing broker-dealer processes, the Plan’s Allocation Report Approach could potentially reduce the time CAT Reporters need to comply with CAT reporting requirements and lower costs by using existing business processes.

(2) Time of Allocations

Under the CAT NMS Plan, CAT Reporters would need to submit the time of an allocation on the Allocation Report which, with the exception of Manual Orders, must be at a millisecond level of granularity.¹⁰⁰⁰

⁹⁹⁸ Response Letter I at 36–37. The Participants estimated compliance costs related to linking orders to executions to be at least \$525 million for the largest broker–dealers. *Id.*

⁹⁹⁹ See April 2015 Supplement, *supra* note 20 (providing examples of how the Allocation Report would be used to link the subaccount holder to those with authority to trade on behalf of the account).

¹⁰⁰⁰ See CAT NMS Plan, *supra* note 5, at Sections 6.4(d)(ii)(A)(1), 6.8(b).

Two commenters argued that the time of allocation should be reported with a timestamp granularity of no finer than one second.¹⁰⁰¹ Three commenters asserted that the timestamps should not be required at all as part of the Allocation Report.¹⁰⁰² One of those commenters noted that, because allocations are part of the post-trade process, the timing of such allocations is not critical, and requiring timestamps on allocations would represent “a potentially costly and misleading reporting requirement divorced from the goals of CAT.”¹⁰⁰³ Another commenter similarly asserted that requiring a timestamp on allocations would be costly and “will not assist the SEC in achieving the expected regulatory benefit.”¹⁰⁰⁴ This commenter explained that instructions for allocations can be communicated by phone, fax, or instant messaging or that standing instructions may be maintained for allocations.¹⁰⁰⁵ Therefore, the commenter stated, the only consistent point at which to capture a timestamp for an allocation is the time the allocation is booked into an allocation processing system.¹⁰⁰⁶

¹⁰⁰¹ Id. These commenters also expressed the view that Business Clocks that capture the time of allocation should be subject to a clock synchronization standard of one second. Id.

¹⁰⁰² SIFMA Letter at 35; FIF Letter at 86–90; FSR Letter at 9.

¹⁰⁰³ SIFMA Letter at 35.

¹⁰⁰⁴ FIF Letter at 86. In support of its objection to including a timestamp in the Allocation Report, this commenter explained that, to detect wrongdoing in the collection process, one could compare the average execution price on the allocation to the market price when the allocation was submitted. If any subaccount had a total and an average profit and loss far exceeding the average profit and loss for all subaccounts of the advisor, such subaccount could be highlighted. Id.

¹⁰⁰⁵ FIF Letter at 86.

¹⁰⁰⁶ Id. This commenter also provided an analysis of the cost for adding a timestamp on allocations. The cost analysis concluded that the cost to the industry of reporting timestamps on allocations to the millisecond with a clock offset of 50 milliseconds would be \$88,775,000. The cost estimate is discussed further in the economic analysis. See Section V.F.3.a(4), infra.

In response, the Participants stated that allocation timestamps would “be a significant tool for detecting regulatory issues associated with allocations, including allocation fraud,” and supported requiring them in the Plan.¹⁰⁰⁷ However, the Participants stated that the cost of changes that would be necessary to capture timestamps to the millisecond may not be justified, particularly in light of the fact that allocations tend to be a manual process. Therefore, the Participants suggested that Allocation Reports should have timestamps with a one second granularity, as is the case with similar Manual Order Events.¹⁰⁰⁸

The Commission agrees with the Participants that inclusion of the time of an allocation as part of the data submitted in the Allocation Report is reasonable to help detect abuse that may occur if executions are allocated among subaccounts at the same time. For example, the Commission believes that the time of allocation will assist regulators in assessing regulatory issues that might arise in the allocation process, such as “cherry-picking” (systematically favoring one customer over another in connection with specific allocation decisions).¹⁰⁰⁹ Currently, investigations of potential cherry-picking require a manual, data-intensive process. The Commission believes that having access to data with the time of allocations should improve regulators’ ability to spot potential abuses and assess the prevalence of allocation practices industry-wide.¹⁰¹⁰ The Commission also believes that data with the time of allocations could

¹⁰⁰⁷ Response Letter I at 37.

¹⁰⁰⁸ Id. at 37–38. Similarly, the Participants also suggested that the Plan be amended to permit Industry Members to synchronize their Business Clocks used solely for reporting of the time of allocation to within one second of NIST, instead of 50 milliseconds. Id.

¹⁰⁰⁹ See Notice, supra note 5, at Section I.e(2).

¹⁰¹⁰ The Commission does not believe that the alternative suggested by one commenter, comparing the average execution price on the allocation to the market price when the

assist in examining whether broker-dealers are making allocations in accordance with their policies and procedures.

With regard to the appropriate level of granularity for the timestamps on Allocation Reports, the Commission agrees with the Participants that, given the manual nature of the allocation process, a timestamp granularity of one second is appropriate and would not reduce the regulatory value of the information. The Commission also believes that the clock synchronization standard for Business Clocks that capture the time of an allocation need only be to the second. This approach is consistent with the approach for Manual Order Events. The Commission does not believe that the regulatory benefit of requiring allocation times to be recorded in milliseconds (compared to seconds) and clock synchronization to 50 milliseconds (compared to one second) justifies the costs at this time.¹⁰¹¹

Accordingly, the Commission is amending Section 6.8(a)(ii) and (b) of the Plan to permit the Business Clocks used solely for the time of allocation on Allocation Reports to be synchronized to no less than within one second of the time maintained by the NIST and the time of allocation on an Allocation Report to the second.

e. Market Maker Quotes

Under the CAT NMS Plan, market maker quotations in Listed Options need to be reported as Reportable Events to the Central Repository only by the applicable Options

allocation was submitted and looking for excess profits and losses, would be nearly as effective, given that the time of the actual allocation would not be available.

¹⁰¹¹ As discussed in the economic analysis, the Commission believes that requiring a one-second timestamp instead of a one-millisecond timestamp for the allocation on Allocation Reports could save \$44 million in implementation costs and \$5 million in annual ongoing costs. See Section V.H.5, *infra*.

Exchange¹⁰¹² and not by the Options Market Maker.¹⁰¹³ However, under the Plan: (1) an Options Market Maker must submit to the relevant Options Exchange, along with any quotation, or any modification or cancellation thereof, the time it sent such message to the Options Exchange (“Quote Sent Time”); and (2) Options Exchanges must submit the Quote Sent Time received from Options Market Makers, along with the applicable message, to the Central Repository without change.¹⁰¹⁴

The requirements for reporting Options Market Maker quotes in the Plan differ from the requirements in Rule 613(c)(7), which provide that the CAT NMS Plan must require each CAT Reporter to record and electronically report to the Central Repository details for each order and each reportable event, including the routing and modification or cancellation of an order.¹⁰¹⁵ Rule 613(j)(8) defines “order” to include “any bid or offer;” so that the details for each Options Market Maker quotation must be reported to the Central Repository by both the Options Market Maker and the Options Exchange to which it routes its quote.¹⁰¹⁶

In the Exemption Request, the Participants noted that requiring the applicable Options Exchange to report market maker quotations to the Central Repository would not degrade the

¹⁰¹² As used in the CAT NMS Plan, “Options Exchange” means a registered national securities exchange or automated trading facility of a registered securities association that trades Listed Options. See CAT NMS Plan, supra note 5, at Section 1.1.

¹⁰¹³ See CAT NMS Plan, supra note 5, at Section 6.4(d)(iii). As used in the CAT NMS Plan, “Options Market Maker” means a broker-dealer registered with an exchange for the purpose of making markets in options contracts traded on the exchange. See id. at Section 1.1.

¹⁰¹⁴ Id.

¹⁰¹⁵ See 17 CFR 242.613(c)(7).

¹⁰¹⁶ See 17 CFR 242.613(j)(8).

reliability or accuracy of the CAT Data, or its security and confidentiality.¹⁰¹⁷ Further, the Participants stated that the proposed approach would not have an adverse effect on the ways in which, and purposes for which, regulators would use, access, and analyze the CAT Data.¹⁰¹⁸ The Participants included a cost-benefit analysis of options data reporting approaches in support of the Exemption Request.¹⁰¹⁹ This analysis noted that the volume of options market maker quotes would be larger than any other category of data to be reported to the Central Repository, generating approximately 18 billion daily records, and that requiring duplicative reporting of this large amount of data would lead to a substantial increase in costs.¹⁰²⁰ The Participants argued in their cost-benefit analysis that eliminating the requirement of Rule 613(c)(7) that both Options Market Makers and Options Exchanges report nearly identical quotation data to the Central Repository would have the potential effect of reducing the projected capacity and other technological requirements of the Central Repository, which could result in significant cost savings.¹⁰²¹

A few commenters expressed support for the provisions of the CAT NMS Plan regarding the reporting of Market Maker Quotations in Listed Options.¹⁰²² One of these commenters stated that permitting only Option Exchanges to report Options Market Maker quote information, instead of both Options Market Makers and Options Exchanges, would not affect the

¹⁰¹⁷ See Exemption Request, supra note 21, at 8.

¹⁰¹⁸ Id. at 7.

¹⁰¹⁹ Id. at 6–7.

¹⁰²⁰ Id.

¹⁰²¹ Id. at 7.

¹⁰²² FIF Letter at 62–64; TR Letter at 8; see also DAG Letter at 2; STA Letter at 1 (supporting the DAG Letter’s Exemptive Request Letter recommendations).

completeness, timeliness, accuracy, security or confidentiality of CAT Data, and would result in a cost savings.¹⁰²³ One commenter suggested that equities market maker quotes should be handled in the same manner as Options Market Maker quotes.¹⁰²⁴

Another commenter, however, suggested that providing an exemption to Options Market Makers for reporting Options Market Maker quotes could be “detrimental to achieving the objective of capturing ‘complete audit trails’ of all the market activities.”¹⁰²⁵ The commenter believed that exempting Options Market Makers from reporting their quotes to the CAT risked “overly discounted/distorted signals” for market surveillance and manipulation detection purposes.¹⁰²⁶

In their response, the Participants disagreed that requiring only the Options Exchanges to report market maker quotations to the Central Repository would be detrimental to the CAT.¹⁰²⁷ The Participants noted that all data that would otherwise be reported by Options Market Makers will still be reported, including Quote Sent Time. The only difference between the requirement under Rule 613 and the approach in the Plan is the reporting party.¹⁰²⁸

With regard to the commenter that suggested equities market maker quotes should be handled in the same manner as Options Market Maker quotes, the Participants explained that they focused on Options Market Makers because of the significant volume of quotes they

¹⁰²³ FIF Letter at 64–65.

¹⁰²⁴ Id. at 65–66.

¹⁰²⁵ Data Boiler Letter at 25.

¹⁰²⁶ Id.

¹⁰²⁷ Response Letter I at 36.

¹⁰²⁸ Id.

produce.¹⁰²⁹ The Participants stated that the volume of equities market maker quotes is much smaller than the volume of options market maker quotes, noting that there are far fewer quote updates for every trade in the equities markets, with an approximate average ratio of quotes to trades of 18 to 1 in the equities markets as compared to ratio of 8,634 to 1 for options.¹⁰³⁰

The Commission believes the proposed approach is reasonable in providing the same regulatory benefits as would be achieved under Rule 613, at a reduced cost and implementation burden on CAT Reporters. The Commission notes that the information that Options Market Makers report to Options Exchanges must be reported to the Central Repository without change, and the information that regulators would receive if Options Market Makers reported their quotation information to the Central Repository would be identical to the information that they will receive under the requirements of the CAT NMS Plan. Therefore, there will be no degradation to the audit trail. The Commission disagrees with the comment that signals for market surveillance and manipulation detection purposes could be distorted if Options Market Makers are not required to report their quotation information¹⁰³¹ because the exact information that the Options Market Makers would report to the CAT will be reported on their behalf by the Options Exchanges. The Commission acknowledges the commenter who recommended that equity market makers also be exempt from reporting their quotes to the CAT, but does not believe that it is appropriate at this time to grant such an exemption. As noted above, equity market makers produce significantly fewer quotes than Options Market Makers, and the

¹⁰²⁹ Id.

¹⁰³⁰ Id. (noting that this is an approximation based on the equities SIP data from the Consolidated Tape Association/Consolidated Quotation System and UTP Plans from June 2014 to June 2016).

¹⁰³¹ Data Boiler Letter at 25.

Commission has not been presented with evidence that reporting equity market maker quotes is unduly burdensome.¹⁰³²

f. Data Elements Not Included in the CAT

One commenter recommended a re-examination of the data elements to be collected in the CAT NMS Plan, and questioned whether a “more broad and complete audit trail” is needed.¹⁰³³ This commenter recommended that the CAT include data on the settlement of securities transactions (i.e., post-execution) from the DTCC and NSCC, short sale information, including lending/borrowing information and pre-execution short sale locate data, and creation/redemption information for Exchange Traded Funds (“ETFs”).¹⁰³⁴

In response to the commenter, the Participants described how the CAT NMS Plan aligns with the scope of required elements in Rule 613. The Participants generally expressed their view that the potential benefit of requiring additional elements, such as settlement information, lending/borrowing information, short sale locate data,¹⁰³⁵ and ETF creation/redemption data,¹⁰³⁶

¹⁰³² The Commission notes that, when considering whether to require Options Market Makers to report their quotes to the Central Repository, the Commission was provided a detailed cost analysis of the savings that would result if Options Market Makers were not required to directly report their quote information to the Central Repository.

¹⁰³³ Anonymous Letter I at 1, 3; see also Anonymous Letter I at 9–15 (stating that CAT Reporters should include ATSS, internalizers, ELPs, clearing firms, the Depository Trust and Clearing Corporation (“DTCC”), National Securities Clearing Corporation (“NSCC”)).

¹⁰³⁴ Anonymous Letter I at 6.

¹⁰³⁵ The Participants noted the definition of Material Terms of the Order includes whether an order is short or short exempt. Response Letter I at 26.

¹⁰³⁶ The Participants explained that the processes involved in the ETF creations and redemptions are distinct from those used for transactions in NMS securities, and may involve parties that are not CAT Reporters. Response Letter I at 25–26.

would be outweighed by the design and implementation costs at this time.¹⁰³⁷ The Participants committed generally to assess whether additional information should be reported to the CAT in the future.¹⁰³⁸

The Commission notes that, with regard to a locate identifier on short sales, data could be readily obtained from a follow-up request to a broker-dealer if the other data required to be reported to the CAT, particularly the information relating to the customer behind the order, is included in the consolidated audit trail.¹⁰³⁹ With regard to lending/borrowing information, the Commission understands that some of this data can be obtained through private sources, such as service providers. The Participants stated that they do not believe that the benefits of including this information in the CAT justify the costs for requiring them to be reported. The Commission similarly believes that it is not necessary to require this information in CAT. With regard to the inclusion of information on ETF creations and redemptions, the Commission agrees with the Participants that the relevant market participants may not be included in the current scope of CAT Reporters. Therefore, the Commission is not amending the Plan to include these data elements in the CAT at this time. Nor is it amending the Plan to include information on the settlement of securities transactions from DTCC and NSCC in the CAT, as it would require participation by entities not currently party to the CAT NMS Plan, and the regulatory benefits to the Participants and the Commission would not, at this time, justify the costs.

The Commission appreciates the commenter's perspective that additional data elements may offer some regulatory benefit. However, neither Rule 613 nor the CAT NMS Plan proposed

¹⁰³⁷ Response Letter I at 26.

¹⁰³⁸ Id. at 25.

¹⁰³⁹ See Proposing Release, supra note 14, at 32574.

including such data elements. After considering the comments, the Commission believes that it is reasonable to not mandate the reporting of new data elements to the CAT at this time. The Commission does not believe that the benefits to the Commission and Participants justify the cost for requiring additional data elements to be reported. The Commission or the Participants may consider additional data elements in the future.

5. Symbology

The CAT NMS Plan requires CAT Reporters to report data using the listing exchange's symbology. The CAT NMS Plan requires the Plan Processor to create and maintain a symbol history and mapping table, as well as provide a tool for regulators and CAT Reporters showing a security's complete symbol history, along with a start-of-day and end-of-day list of reportable securities for use by CAT Reporters.¹⁰⁴⁰

Three commenters objected to the Plan requiring listing exchange symbology to be used by CAT Reporters.¹⁰⁴¹ One commenter recommended that CAT Reporters be permitted to use the symbology standard they currently use and that the Central Repository should be responsible for normalizing the various standards.¹⁰⁴² The commenter stated that while it does not expect that allowing CAT Reporters to use existing symbology would result in a large cost savings, it believes that use of existing symbology would reduce errors.¹⁰⁴³

¹⁰⁴⁰ See CAT NMS Plan, supra note 5, at Appendix D, Section 2.

¹⁰⁴¹ FIF Letter at 95; Bloomberg Letter at 5–6; Data Boiler Letter at 36 (recommending the use of multiple formats and favoring use of “existing market practices/processes”).

¹⁰⁴² FIF Letter at 95.

¹⁰⁴³ Id. The commenter also requested clarity on what symbology would be used for options. Id. This comment was not addressed by the Participants.

Another commenter expressed the view that it would be costly to use the listing exchange's symbology for reporting to the CAT and instead advocated for a standardized nomenclature or symbology across the markets, stating that without a standardized data nomenclature, the integration of a data reporting system and surveillance will be significantly more difficult.¹⁰⁴⁴ The commenter suggested use of a uniform, global, open, multi-asset identifier, such as the Financial Instrument Global Identifier ("FIGI"), a product developed by Bloomberg LP.¹⁰⁴⁵ The commenter stated that use of a standard with the characteristics of FIGI would simplify cross-asset surveillance, lower error rates and potentially lower symbology licensing costs.¹⁰⁴⁶

The Participants responded that the Plan required CAT Reporters to submit data to the CAT using the listing exchange symbology based on their understanding of current reporting practices.¹⁰⁴⁷ The Participants noted that Industry Members use solutions and systems that allow them to translate symbology into the correct format of the listing exchange when submitting data to exchanges or regulatory reporting systems, such as OATS and Electronic Blue Sheets ("EBS").¹⁰⁴⁸ The Participants further noted that all CAT Reporters subject to OATS or EBS reporting requirements use the symbology of the listing exchange when submitting such reports.¹⁰⁴⁹ Accordingly, the Participants did not agree with the comment that advocated

¹⁰⁴⁴ Bloomberg Letter at 5.

¹⁰⁴⁵ Id. at 6.

¹⁰⁴⁶ Id.

¹⁰⁴⁷ Response Letter II at 7.

¹⁰⁴⁸ Response Letter III at 13.

¹⁰⁴⁹ Response Letter II at 7 (citing OATS Reporting Technical Specifications (September 12, 2016), available at http://www.finra.org/sites/default/files/TechSpec_9122016.pdf)

adopting a new symbology approach, concluding that it would add significant cost and complexity for the industry.¹⁰⁵⁰ The Participants also noted that permitting CAT Reporters to use symbology other than the listing exchange symbology, and having the Plan Processor translate the symbology of different CAT Reporters to the listing exchange symbology, would require each CAT Reporter to submit regular mapping symbology information to the CAT, thereby increasing the complexity and the likelihood for errors in the CAT.¹⁰⁵¹ The Participants stated that the requirement to use exchange symbology is the most efficient, cost-effective and least error-prone approach.¹⁰⁵² The Participants, however, acknowledged that the Plan Processor may, in the future, determine whether the use of a standardized symbology, other than listing exchange symbology, would be appropriate.¹⁰⁵³

The Commission believes that the CAT NMS Plan's requirement that CAT Reporters report data using the listing exchange's symbol is reasonable. The Commission agrees with the Participants that allowing each CAT Reporter to determine its reporting symbology would impose burdens on, and add complexity for, the Plan Processor by requiring each CAT Reporter to regularly submit to the Plan Processor symbology mappings. Additionally, the Commission

(requiring data to be reported using symbol format published by primary listing exchange for listed securities).

¹⁰⁵⁰ Id. The Plan requires the Participants to provide the Plan Processor with issue symbol information, and the Plan Processor to maintain a complete symbology database, including historical symbology. In addition, issue symbol validation must be included in the processing of data submitted by CAT Reporters. See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(a); Appendix D, Section 2.

¹⁰⁵¹

Id.

¹⁰⁵²

Response Letter II at 7.

¹⁰⁵³

The Participants noted, based on conversations with the DAG and as noted by one commenter, certain industry messaging formats, such as some exchange binary formats, require symbology other than the primary listing exchange symbology. Id.

believes that using existing symbology may reduce errors, as noted by the Participants. The Commission also understands, based on the Participants' representations, that CAT Reporters that report to OATS and EBS today already have the ability to translate to the listing exchange's symbology.

6. Security of CAT Data

The CAT NMS Plan requires that the Plan Processor develop and, with the prior approval of the Operating Committee, implement, policies, procedures and control structures related to the security of the CAT System.¹⁰⁵⁴ Appendices C and D describe the general security requirements for CAT data and outline minimum data security requirements that the Plan Processor must meet.¹⁰⁵⁵

a. CAT Information Security Program Details

Several commenters believed that the CAT NMS Plan did not provide enough details regarding the security and confidentiality of CAT Data. One commenter noted that "explicit language indicating requirements for overall security of data transmission and storage, rather than suggestions, should be included in the finalized CAT requirements."¹⁰⁵⁶ Another commenter stated that the Plan does not provide enough granular details related to actual

¹⁰⁵⁴ See CAT NMS Plan, supra note 5, at Section 6.1(c); see also Sections III.26 and III.27, supra.

¹⁰⁵⁵ See CAT NMS Plan, supra note 5, at Appendix C and D.

¹⁰⁵⁶ SIFMA Letter at 20; see also ICI Letter at 4 (stating that "despite the highly sensitive nature of the data captured by the CAT, the proposed CAT NMS plan provides only vague details about the information security provisions for the CAT. . . . [W]e understand that certain details of the plan processor's information security program must remain confidential, but the proposed CAT NMS plan sets too low of a bar for information security").

controls, service levels, and technical support that will be implemented by the Plan Processor.¹⁰⁵⁷ Similarly, another commenter stated that the CAT NMS Plan lacks proper guidance concerning the requirements for security and confidentiality controls of the CAT System regarding, for example, network security, firewalls, systems management and library controls, IT personnel access to the CAT System and data, system logs and archives.¹⁰⁵⁸ One commenter “urg[ed] the SEC to require the SROs to share more detailed information on [data loss prevention, business continuity plans and cyber incident response plans] as a Plan Processor is selected and the Central Repository is built.”¹⁰⁵⁹ Other commenters suggested that certain market participants be provided another opportunity to provide feedback on the security controls, policies and procedures that will be adopted by the Plan Processor.¹⁰⁶⁰ Another commenter supported having an information security officer be responsible for regular updates of the documents and processes, breach identification, and management and processes for periodic penetration tests of all applications.¹⁰⁶¹

In response to commenters that requested more detail regarding the security controls for CAT Data, the Participants noted that in the Adopting Release for Rule 613, the Commission

¹⁰⁵⁷ FSR Letter at 6; see also TR letter at 8 (seeking clarification on the service levels and liability that will be associated with data transfers between CAT Reporters and the CAT Processor, and how information security will be addressed with customer service staff at the Plan Processor that will assist CAT Reporters with troubleshooting).

¹⁰⁵⁸ FIF Letter at 131–132.

¹⁰⁵⁹ Fidelity Letter at 4.

¹⁰⁶⁰ One commenter, for example, suggested that experts from Industry Members be permitted to review and provide feedback on the security controls, policies and procedures of the Plan Processor. FIF Letter at 130. Another suggested that market participants be provided an opportunity to comment on these important details. Fidelity Letter at 4.

¹⁰⁶¹ UnaVista Letter at 5.

stated that “an outline or overview description of the policies and procedures that would be implemented under the NMS plan submitted to the Commission for its consideration would be sufficient to satisfy the requirement of the Rule.”¹⁰⁶² The Participants also reiterated the position of the Commission at the time of adoption of Rule 613 that “it is important for the NMS plan submitted to the Commission to establish the fundamental framework of these policies and procedures, but recognizes the utility of allowing the plan sponsors flexibility to subsequently delineate them in greater detail with the ability to make modifications as needed.”¹⁰⁶³ The Participants noted that Section 6.12 of the CAT NMS Plan requires the Plan Processor to develop and maintain a comprehensive information security program for the Central Repository, to be approved and reviewed at least annually by the Operating Committee.¹⁰⁶⁴

The Participants also referred to Appendix D of the Plan, which discusses the fundamental framework of this program, including: (1) appropriate solutions and controls to ensure data confidentiality and security during all communications between CAT Reporters and Data Submitters and the Plan Processor, data extraction, manipulation and transformation, loading to and from the Central Repository and data maintenance by the CAT System; (2) security controls for data retrieval and query reports by Participants and the SEC; and (3) appropriate tools, logging, auditing and access controls for all components of the CAT System.¹⁰⁶⁵ The Participants further noted the Plan provisions addressing: (1) the physical assets and personnel of the CAT; (2) training of all persons who have access to the Central

¹⁰⁶² Response Letter I at 53-54 (citing Adopting Release, supra note 14, at 45782).

¹⁰⁶³ Response Letter I at 53-54 (citing Adopting Release, supra note 14, at 45782).

¹⁰⁶⁴ Id.

¹⁰⁶⁵ Response Letter I at 54.

Repository; (3) encryption; (4) remote access to the CAT System; (5) the handling of PII; (6) data storage (including penetration testing and third party audits); (7) access to PII and other CAT Data; breach management; and (8) the minimum industry standards that must be followed by the Plan Processor in developing and implementing the security and confidentiality policies and procedures for the Plan.¹⁰⁶⁶ The Participants also provided a high level description of the security requirements for the CAT System, which described the architecture controls, program level controls, and data usage and regulator controls applicable to the CAT.¹⁰⁶⁷ Notably, the Participants also stated that they believe that “publicly releasing too many details about the data security and information policies and procedures of the CAT System presents its own security concerns and is not advisable.”¹⁰⁶⁸

The Participants stated that they do not believe that market participants such as experts from Industry Members should be permitted to review and provide feedback on the security controls, policies and procedures of the Plan Processor because each Bidder already has provided information on the various security issues discussed in the Plan and as a result, the Plan Processor will have sufficient information from which to formulate appropriate data security and information policies and procedures.¹⁰⁶⁹ The Participants added that data security policies and procedures of the Plan Processor will be subject to the review and approval of the Operating Committee, which will seek the views of the Advisory Committee.¹⁰⁷⁰ Therefore, the

¹⁰⁶⁶ Id.

¹⁰⁶⁷ Id.

¹⁰⁶⁸ Id.

¹⁰⁶⁹ Response Letter I at 55.

¹⁰⁷⁰ Id.

Participants do not believe that it is necessary to allow Industry Members to separately review the security controls, policies and procedures of the Plan Processor.¹⁰⁷¹

The Participants also provided additional details concerning certain security controls and protocols required of the Plan Processor. Specifically, the Participants noted that the Plan Processor must establish a penetration testing protocol and that the Participants generally would expect penetration testing to occur following major changes to system architecture (e.g., changes in the network segmentation, major system upgrades, or installation of new management level applications), or when other specific new threats are identified.¹⁰⁷² The Participants also provided additional detail clarifying their threat monitoring program and stated that they expect that the Plan Processor will “adhere to industry practice for an infrastructure initiative such as the CAT, and, therefore, the Plan Processor will provide 24x7 operational monitoring, including monitoring and alerting for any potential security issues across the entire CAT environment.”¹⁰⁷³ Related to threat monitoring, the Participants noted that the CISO also is required to establish policies and procedures to address imminent threats.¹⁰⁷⁴ Specifically, the Participants stated that they expect the CISO to establish procedures for addressing security threats that require immediate action to prevent security threats to the CAT Data.¹⁰⁷⁵

The Commission fully recognizes the importance of maintaining the security of the CAT Data and the need to have sufficient information regarding the policies, procedures and control

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Id.

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Response Letter III at 7.

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Id.

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Response Letter III at 8.

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Id.

structures that will be adopted by the Plan Processor that will apply to the security of the CAT Data. The Commission also reiterates its view, as set forth in the Adopting Release and as noted by the Participants in their response, that an outline or overview description of the policies and procedures that would be implemented by the Plan Processor regarding data security satisfies the requirements of Rule 613 and that it is reasonable for additional detail about the controls, policies and procedures applicable to the CAT's information security program to be determined and published after the Plan Processor is selected, including through the CAT's Technical Specifications, which will be publicly available.¹⁰⁷⁶ The Commission also shares the concerns articulated by the Participants that publicly releasing too many details about the technical security requirements, tools and techniques of the CAT NMS Plan could invite exploitation. The Commission believes that the CAT NMS Plan must strike a balance between setting out the fundamental framework for the security of the CAT Data while maintaining the ability of the Plan Processor to adopt additional security parameters as it sees fit, some of which the Plan Processor may not want to make public.

The Commission has considered the security provisions in the CAT NMS Plan and finds that a reasonable level of detail regarding the security and confidentiality controls has been provided in the CAT NMS Plan. However, the Commission expects that the Participants will require the Plan Processor to continuously monitor the information security program of the CAT to ensure that it is consistent with the highest industry standards for the protection of data, and to proactively implement appropriate changes to the security program to guard against any unauthorized intrusions or breaches of the Plan Processor's data security protocols and

¹⁰⁷⁶ See CAT NMS Plan, supra note 5, at Section 6.9(a).

protections. The Commission also expects that, when the Plan Processor is chosen, the Plan Processor will provide more detail about the specific security requirements and attendant obligations placed on the Participants, including through the issuance of Technical Specifications, which will be publicly available; more explicit language indicating requirements for overall security of data transmission and storage; more granularity related to actual controls and service levels; and more details about the technical support that will be implemented by the Plan Processor. The Commission also notes that, as discussed in Section IV.H, the Commission is amending Section 6.6 of the Plan to require that the Participants provide the Commission with an annual evaluation of the information security program to ensure that the program is consistent with the highest industry standards for the protection of data.¹⁰⁷⁷

The Commission also believes that, based on the CAT NMS Plan and the Participants' response, a reasonable level of detail and explicit requirements regarding the overall security of data transmission, storage, service levels, and technical support has been provided.¹⁰⁷⁸ Similarly, the Commission believes that the Plan adequately addresses network security, firewalls, systems management, data loss prevention, business continuity plans and cyber incident response plans.¹⁰⁷⁹ In response to the commenters that requested that market participants such as experts from Industry Members be permitted to review and provide feedback on the security controls,

¹⁰⁷⁷ See Section IV.H, supra.

¹⁰⁷⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(b) (discussing the manner in which the Central Repository will receive, extract, transform, load, and retain data); Section 6.10(c) (discussing the CAT user Help Desk).

¹⁰⁷⁹ See CAT NMS Plan, supra note 5, at Appendix D, Section 4 (Data Security); Section 5 (Business Continuity/Disaster Recovery).

policies and procedures of the Plan Processor, the Commission believes that such review and feedback is not necessary, particularly in light of input by the Advisory Committee.

In response to the commenter that supported having an information security officer be responsible for regular updates of the documents and processes, breach identification, and management and processes for periodic penetration tests of all applications, the Commission notes that the Plan provides for a CISO who has a broad range of responsibilities regarding the security of the CAT Data.

b. Security Standards for the CAT System

Several commenters put forth various industry security standards that should be adopted by the Plan Processor. One commenter stated that if the CAT System operates using a cloud infrastructure, the CAT should employ a cloud provider rated for security via the Cloud Controls Matrix from the Cloud Security Alliance.¹⁰⁸⁰ This commenter further recommended that the CAT “be subject to existing data security and privacy standards like Regulation P [Annual Privacy Notice Requirement under the Gramm-Leach-Bliley Act], FISMA [Federal Information Security Management Act] and FedRAMP [Federal Risk and Authorization Management Program].”¹⁰⁸¹ One commenter stated that steps should be taken to ensure proper controls are in place to protect the data throughout its lifecycle using secure, authenticated and industry-accepted encryption mechanisms.¹⁰⁸² Another commenter recommended the use of “pre-defined extract templates and uniform global formats such as ISO [International Organization for

¹⁰⁸⁰ SIFMA Letter at 21.

¹⁰⁸¹ Id.

¹⁰⁸² FSI Letter at 5 (citing to Government Accountability Office, High-Risk Series: An Update, GAO-15-290 at 235 (Feb. 2016)).

Standardization] 2002.”¹⁰⁸³ One commenter stated that at a minimum, connection to CAT infrastructure should be protected by transport layer security/secure sockets layer (“TLS/SSL”) through a secure tunnel.¹⁰⁸⁴ Another commenter suggested that the CAT NMS Plan employ the cybersecurity framework developed by NIST and the cybersecurity assessment tool created by the Federal Financial Institutions Examination Council (“FFIEC”).¹⁰⁸⁵

One commenter noted the need for an ongoing assessment of the risks associated with the CAT System and data to meet the NIST industry standards referenced in the Plan.¹⁰⁸⁶ In discussing the confidentiality and sensitivity of CAT Data, a commenter noted that “[t]he emphasis shouldn’t be favoring on [sic] a particular prescribed standard . . . but the key is: CAT needs independence [sic] privacy and security assessment at regular intervals. The assessment will include: vulnerability scan and identifying system nuisances that can cause or already caused privacy and security issues.”¹⁰⁸⁷

With respect to the industry standards applicable to the CAT System, in their response, the Participants noted that at the outset of operation of the CAT, the Plan Processor will adopt all relevant standards from the NIST Cyber Security Framework, NIST 800.53 or ISO 27001 that would be appropriate to apply to the Plan Processor.¹⁰⁸⁸ The Participants added that because industry standards may evolve over time, the Participants will require that the CAT’s security

¹⁰⁸³ UnaVista Letter at 4.

¹⁰⁸⁴ FIF Letter at 133.

¹⁰⁸⁵ ICI Letter at 5.

¹⁰⁸⁶ FIF Letter at 130–31.

¹⁰⁸⁷ Data Boiler Letter at 29.

¹⁰⁸⁸ Response Letter III at 5.

program align with current industry standards and best practices as they evolve in the future.¹⁰⁸⁹

To this end, the Plan requires that the Plan Processor’s information security program be reviewed at least annually by the Operating Committee.¹⁰⁹⁰

Regarding security standards applicable to the Participants that access CAT Data, the Participants noted that the Plan requires the Participants to “establish, maintain and enforce written policies and procedures reasonably designed . . . to ensure the confidentiality of the CAT Data obtained from the Central Repository.”¹⁰⁹¹ The Participants stated that “such policies and procedures will be subject to Reg SCI and oversight by the SEC.”¹⁰⁹² Moreover, in their response, the Participants stated that “[i]n the event that relevant standards evolve, the proposed Plan also requires that ‘[e]ach Participant shall periodically review the effectiveness of the policies and procedures. . . and take prompt action to remedy deficiencies in such policies and procedures.’”¹⁰⁹³

In response to the commenters that believed that an ongoing assessment of the risks associated with the CAT System and data should meet the NIST standards in the Plan, the Participants stated that they agree that the CAT System should be regularly assessed for security risks,¹⁰⁹⁴ and that the Operating Committee must conduct an annual review of the Plan Processor’s information security program.¹⁰⁹⁵ The Participants further noted that Section

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Id.

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Id.

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Response Letter III at 8.

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Id.

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Response Letter III at 8.

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Response Letter I at 61.

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Response Letter III at 5.

6.2(a)(v)(C) of the Plan provides that the CCO, in collaboration with the CISO, will retain independent third parties with appropriate data security expertise to review and audit on an annual basis the policies, procedures, standards and real-time tools that monitor and address data security issues for the Plan Processor and the Central Repository.¹⁰⁹⁶

In response to the commenter that believed that the Plan Processor should be FedRAMP certified, the Participants stated that they do not believe that the Plan Processor should be required to be certified FedRAMP.¹⁰⁹⁷ The Participants stated that requiring FedRAMP certification could limit the portions of each cloud provider's solutions that each Bidder may access, while also increasing costs for the CAT. The Participants stated that furthermore, FedRAMP certification itself does not provide for additional security controls beyond those contained in the NIST standards, but rather focuses on providing a certification and evaluation process for government applications.¹⁰⁹⁸ Moreover, the Participants believe that the security controls required in the Plan and proposed by the Bidders, as well as those provided by the Bidders' cloud providers, are robust and would not be materially enhanced by requiring them to be FedRAMP certified.¹⁰⁹⁹ The Participants also pointed out that regular independent third party audits, as required by the Plan, also would help to ensure the security of the CAT and any cloud solutions in use.¹¹⁰⁰

¹⁰⁹⁶ Response Letter I at 61.

¹⁰⁹⁷ Response Letter III at 5.

¹⁰⁹⁸ Response Letter III at 5.

¹⁰⁹⁹ Response Letter III at 5-6.

¹¹⁰⁰ Id.

The Commission notes that Appendix D of the Plan addresses the security standards applicable to the CAT System. Specifically, Section 4.2 of Appendix D of the CAT NMS Plan, as proposed, states that “[t]he following industry standards, at a minimum, must be followed as such standards and requirements may be replaced by successor publications, or modified, amended, or supplemented and as approved by the Operating Committee (in the event of a conflict between standards, the more stringent standard shall apply, subject to the approval of the Operating Committee).”¹¹⁰¹ The Plan then lists several NIST standards (e.g., NIST 800), FFIEC’s “Authentication Best Practices,” and ISO/IEC 27001’s “Information Security Management. Appendix D, Section 4.2, as proposed, also states that the CAT LLC shall join the Financial Services-Information Sharing and Analysis Center (“FS-ISAC”) and comparable bodies as the Operating Committee may determine.

Moreover, in the Commission’s view, the Participants’ commitment in their response that, at the outset of the operation of CAT, the Plan Processor will adhere to the relevant standards from the NIST Cyber Security Framework is a reasonable step toward ensuring a robust security information program. At this time, the Commission believes that the NIST Cyber Security Framework provides a reliable and comprehensive approach to cybersecurity risks and threats, and helps to ensure that the Plan Processor will be abiding by appropriately rigorous industry standards to help identify, protect, detect, respond and recover from cyberattacks, whether internal or external, domestic or international. Accordingly, the Commission is amending Appendix D, Section 4.2 of the CAT NMS Plan to add the requirement that Plan

¹¹⁰¹ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.2.

Processor will adhere to the NIST Cyber Security Framework in its entirety.¹¹⁰² The Commission believes that adherence to the standards of the NIST Cyber Security Framework provides a reasonable approach to ensuring that security standards applicable to the CAT System will reflect high industry standards regarding the protection of CAT Data.

In light of the Participants' commitment and ongoing requirement to adhere to the NIST Cyber Security Framework – which will address the security of the CAT cloud provided by the Plan Processor – and the limitations that FedRAMP certification might impose on the cloud provider's solutions that each bidder might access should the bidder be chosen as the Plan Processor, the Commission believes that it is reasonable to not require that the Plan Processor be FedRAMP certified. In addition, the Commission believes that it is reasonable to allow the Plan Processor to evaluate whether it should adhere to the data security and privacy standards like Regulation P, FISMA and ISO 2002, and whether the connection to the CAT infrastructure should be protected by TLS/SSL.

The Commission also notes that in their response, the Participants stated that with respect to partnerships with other private or public organizations and information sharing entities, the Participants do not intend to restrict the CAT LLC's partnership only to the FS-ISAC; the Participants stated that the CAT LLC may seek to join other industry groups such as the National Cyber-Forensic & Training Alliance, the Department of Homeland Security's National

¹¹⁰² The Commission notes that, in contrast to the Participants' response, the Commission is amending the Plan without limitation to only "relevant standards" because the Commission believes that the NIST Cyber Security Framework already provides flexibility to ensure only relevant standards apply, and without specific reference to NIST 800-53 or ISO 27001. The Commission also is amending Appendix D, Section 4.2 of the Plan to clarify that the listed industry standards are not intended to be an exclusive list. The Commission believes this amendment is appropriate to clarify that the Participants may adhere to additional industry standards.

Cybersecurity & Communications Integration Center, or other reputable cyber and information security alliances.¹¹⁰³ The Commission believes the Participants have appropriately clarified that the provisions in Appendix D, Section 4.2 of the Plan listing the other organizations that the CAT LLC may join was not intended to be an exclusive list because the provision explicitly states that the CAT LLC shall endeavor to join other “comparable bodies as the Operating Committee may determine.”

c. CAT User Access Administration

Many commenters discussed issues related to the administration of CAT users. One commenter stated that “[a]ppropriate policies and procedures should be in place for user access administration, including provisioning of administrators, user data management, password management and audit of user access management.”¹¹⁰⁴ Another commenter noted the need to train employees and contractors with access to CAT Data on how to maintain the security and confidentiality of the data,¹¹⁰⁵ while another commenter supported the establishment of processes to prevent access to sensitive data by any individuals who have not attended compliance training.¹¹⁰⁶ One commenter stated that persons authorized to access CAT Data should have comprehensive background checks.¹¹⁰⁷

Other commenters discussed the password authentication procedures in the CAT NMS Plan that are meant to ensure that CAT Data is only accessed by credentialed personnel. One

¹¹⁰³ Response Letter III at 6–7.

¹¹⁰⁴ SIFMA Letter at 21.

¹¹⁰⁵ ICI Letter at 9.

¹¹⁰⁶ UnaVista Letter at 4.

¹¹⁰⁷ FSR Letter at 5; FSI Letter at 5.

commenter stated that all persons with access to the CAT System should have their access secured via multi-factor authentication as prescribed in OMB Memorandum M-06-16.¹¹⁰⁸

Another commenter suggested leveraging any authentication procedures at the entity that employs a person seeking access to CAT Data, stating that this approach would also allow for automated deactivation of users that leave the CAT Reporter or Participant.¹¹⁰⁹

In its response to commenters, the Participants noted the provisions in Appendix D of the Plan that require the Plan Processor to develop and maintain policies and procedures reasonably designed to prevent, detect and mitigate the impact of unauthorized access or usage of data in the Central Repository.¹¹¹⁰ The Participants further noted that the Plan requires that such policies and procedures include, at a minimum, (1) information barriers governing access to and usage of data in the Central Repository; (2) monitoring processes to detect unauthorized access to or usage of data in the Central Repository; and (3) escalation procedures in the event that unauthorized access to or usage of data is detected.¹¹¹¹ The Participants also note that the Plan requires that passwords be stored according to industry best practices and recovered by secure

¹¹⁰⁸ MFA Letter at 6.

¹¹⁰⁹ SIFMA Letter at 21. This commenter also generally recommended automatic deactivation for users who do not access CAT for a specified period of time (e.g., 6 months), or whose access is not re-confirmed by the entity who employs the person requesting CAT Data, or whose firm account has been deactivated. Additionally, the commenter stated that email addresses for CAT users should be immutable and should allow for change via administrative review workflow, and shared user IDs should be prohibited. Id.

¹¹¹⁰ Response Letter I at 55–56.

¹¹¹¹ Id.

channels, and that all logins will be subject to MFA.¹¹¹² The Participants further note that the Plan Processor will have discretion to consider additional controls on user access in formulating the data security policies and procedures for the CAT System, including, without limitation, deactivating users who have not accessed the CAT System for a specified period of time.¹¹¹³

The Commission believes that monitoring the access to CAT to ensure that only authorized persons are allowed to access the CAT System and CAT Data is critical to ensuring the security of CAT Data. The Commission agrees with the Participants that the requirements set out in Appendix D, and other provisions of the CAT NMS Plan, provide a reasonable outline of CAT user access administration (including provisioning of administrators) in general, as well as user data management and password management.¹¹¹⁴

In response to specific commenters that believed that only individuals with appropriate training should be permitted access to CAT Data, Section 6.1(m) of the Plan states that “[t]he Plan Processor shall develop and, with the prior approval of the Operating Committee, implement a training program, which will be made available to all individuals who have access to the Central Repository on behalf of the Participants or the SEC prior to such individuals being granted access to the Central Repository, that addresses the security and confidentiality of all information accessible from the CAT, as well as the operational risks associated with accessing

¹¹¹² The Commission notes that certain provisions of the Plan appeared to require MFA only for access to PII. The Participants clarified in their response letter that MFA is required for all logins. Response Letter III at 6.

¹¹¹³ Response Letter I at 56.

¹¹¹⁴ See CAT NMS Plan, *supra* note 5, at Appendix D, Section 4.1.4 (discussing an overview of access to CAT Data).

the Central Repository.”¹¹¹⁵ Appendix D of the Plan also states that the Plan Processor must provide to the Operating Committee a comprehensive security plan that covers all components of the CAT System, including physical assets and personnel, and the training of all persons who have access to the Central Repository consistent with Article VI, Section 6.1(m).¹¹¹⁶ Thus, the Commission believes that these Plan provisions, taken together, indicate that the Plan Processor will require that all persons that have access to CAT Data will be required to complete training prior to accessing CAT Data, and expects that only those persons that have been adequately trained will have access to CAT Data.

In response to the commenter that stated that persons authorized to access CAT Data should have comprehensive background checks, the Commission notes that the Plan provides that “in addition to other policies, procedures and standards generally applicable to the Plan Processor’s employees and contractors, the Plan Processor shall have hiring standards and shall conduct and enforce background checks (e.g., fingerprint-based) for all of its employees and contractors to ensure the protection, safeguarding and security of the facilities, systems, networks, equipment and data of the CAT System. . . .”¹¹¹⁷ While the Commission believes that this provision sets out a reasonable approach to background checks for employees and contractors of the Plan Processor, the Commission believes that such a requirement generally should extend to Participants with respect to all of their users that have access to CAT Data and therefore is amending the Plan to require that each Participant conduct background checks for its

¹¹¹⁵ See CAT NMS Plan, supra note 5, at Section 6.1(m).

¹¹¹⁶ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.

¹¹¹⁷ See CAT NMS Plan, supra note 5, at Section 6.1(g).

employees and contractors that will use the CAT System.¹¹¹⁸ The Commission believes that this amendment to the Plan is appropriate in order to ensure that only authorized and qualified persons are using the CAT System.

The Commission also notes that the Participants have represented that all logins must be secured by MFA, in response to commenters concerns that authentication procedures for CAT users should ensure that only credentialed persons are accessing the CAT Data. In addition, in response to commenters that expressed concerns about the password authentication procedures of the Plan Processor, the Commission notes that the Plan addresses password guidelines such as, for example, the appropriate complexity of passwords and the recovery of lost passwords.¹¹¹⁹ The Commission also believes that the Plan does not prohibit the Plan Processor from considering an approach to authenticating a CAT user that would leverage the authentication procedures at the entity (either a Participant or CAT Reporter) that employs a person seeking access to CAT Data, as suggested by a commenter. The Commission believes these provisions, taken together, provide reasonable protections around CAT user administration.

Finally, with respect to another aspect of CAT user access administration, in their response the Participants noted that they do not believe that memoranda of understanding or similar agreements between the CAT LLC and the Participants are necessary since the Participants will be bound by both their participation in the Plan as well as the agreement between the CAT LLC and the Plan Processor.¹¹²⁰ However, the Participants stated they believe

¹¹¹⁸ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.4.

¹¹¹⁹ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.4 (discussing an overview of the CAT password requirements).

¹¹²⁰ Response Letter III at 8.

that it is important that information regarding CAT Data usage, such as contact points and escalation procedures, be shared between the Plan Processor and the Participants; therefore, the Participants state they expect to establish such information sharing agreements between the Plan Processor and the Participants once the Plan Processor is chosen. Moreover, the Participants stated, they expect that one of the CISO's responsibilities would be to make sure that this information is captured and kept up to date appropriately.¹¹²¹

The Commission notes that the Plan Processor has not yet been chosen and thus the execution of such memoranda is not appropriate at this time. However, the Commission believes that explicitly memorializing issues relating to CAT Data usage between the Plan Processor and each Participant would be beneficial to the operation of the CAT System.

The Commission also notes that, with respect to access, the CAT NMS Plan provides that the Plan Processor will provide to the Participants and the Commission access to the Representatives of the Plan Processor as any Participant or the Commission may reasonably request solely for the purpose of performing such Person's regulatory and oversight responsibilities pursuant to the federal securities laws, rules, and regulations or any contractual obligations.¹¹²² The Plan also provides that the Plan Processor will direct its Representatives to reasonably cooperate with any inquiry, investigation, or proceeding conducted by or on behalf of any Participant or the Commission related to such purpose.¹¹²³ As filed, this provision would allow the Plan Processor to refuse access to the Commission and/or Participants upon its own determination of "unreasonableness." The Commission believes that Commission or Participant

¹¹²¹ Response Letter III at 9.

¹¹²² See CAT NMS Plan, supra note 5, at Section 6.1(u).

¹¹²³ Id.

requests for access to Representatives of the Plan Processor should be considered reasonable, absent other circumstances. It is therefore amending the Plan to delete the requirement that the access to Plan Processor Representatives be “reasonable” and that the Representatives of the Plan Processor only be required to “reasonably” cooperate with any inquiry, investigation, or proceeding conducted by or on behalf of the Commission. The Commission expects that, even without the “reasonableness” qualifier, it and the Participants will be reasonable in requesting access to the Representatives of the Plan Processor.

d. Downloading CAT Data By Regulators

Several commenters discussed the security risks associated with the downloading of CAT Data by regulators. One commenter argued that CAT Data should never be extracted, removed, duplicated, or copied from the CAT, noting that such practices would introduce additional risk and render even the most advanced security measures ineffective.¹¹²⁴ Instead, this commenter recommended allowing data to be imported into a CAT query sub-system if surveillance is needed in conjunction with external data.¹¹²⁵ Another commenter similarly noted the security risk associated with extracting data from the Central Repository and stated its preference for an approach “where the data is accessible by the Regulators but the data is not extracted and stored outside the Central Repository, except for extraction of ‘comparable’ data that would facilitate exemption from duplicative reporting and retirement of high priority duplicative systems.”¹¹²⁶

¹¹²⁴ SIFMA Letter at 20; see also Data Boiler Letter at 26 (stating “CAT should under ABSOLUTELY NO CIRCUMSTANCE (including BCP/DR) allow anyone the option of to download the ‘entire’ data sets, because this essentially opens a ‘backdoor’ to significant security risk.”).

¹¹²⁵ SIFMA Letter at 20.

¹¹²⁶ FIF Letter at 134.

This commenter added “if combined datasets surveillance is needed (with data external to CAT), the SROs should be allowed to upload external SRO data to a sandbox environment within CAT, in order to enable combined surveillance.”¹¹²⁷

Another commenter stated that the CAT NMS Plan’s provision permitting the Commission and SROs to download entire data sets and analyze the data within the regulator’s systems or the regulator’s cloud, and the Plan’s proposal to allow broker-dealers to “verify certain data that they have submitted to the CAT,” represent security risks to CAT Data that the SEC and SROs should avoid.¹¹²⁸ This commenter further noted that having multiple points of access to CAT Data, and the ability to download CAT Data, raise “significant cybersecurity concerns and outweigh the benefit of access to processed CAT [D]ata.”¹¹²⁹ Another commenter believed that CAT Data should remain in the Central Repository, but noted that if the Commission determines to permit the downloading of CAT Data, the CAT NMS Plan should only allow a user to download CAT Data if the information security measures available at the user’s site equal or exceed those protecting the data at the Central Repository.¹¹³⁰

In response to commenters, the Participants noted that Rule 613 requires regulators to develop and implement a surveillance system, or enhance existing surveillance systems to make use of CAT Data.¹¹³¹ The Participants stated that regulators should have flexibility in designing such surveillance systems, including the ability to access and transfer data where necessary and

1127

Id.

1128

Fidelity Letter at 4.

1129

Id.

1130

ICI Letter at 7.

1131

Response Letter I at 56.

consistent with appropriate data security safeguards.¹¹³² Such access must be via secure channels (e.g., secure FTP, API or over encrypted lines) as required in the Plan.¹¹³³ The Participants further noted that the Plan requires that Participants have appropriate policies and procedures in place to protect such data.¹¹³⁴ Specifically, the Plan requires that Participants establish, maintain and enforce written policies and procedures reasonably designed to ensure the confidentiality of CAT Data.¹¹³⁵ The Participants also stated that they believed that all regulators, including the Commission, should be obligated to establish security measures to protect the security and confidentiality of CAT Data for security purposes.¹¹³⁶

The Participants also noted that the CAT NMS Plan requires the Plan Processor to provide regulators with the ability to perform bulk data extraction and download of CAT Data.¹¹³⁷ The Participants stated they continue to believe that permitting regulators to download order/transaction data from the Central Repository for regulatory use (i.e., “bulk data extracts”) is important for their regulatory purposes, and that eliminating or limiting bulk data extracts of the CAT Data may significantly and adversely impact the Participants’ ability to effectively conduct surveillance of their markets using CAT Data. The Participants stated that they also plan to enrich their existing surveillance using bulk data extracts of CAT Data.¹¹³⁸

1132 Id.

1133 Id.

1134 Id.

1135 Id. (citing to CAT NMS Plan, supra note 5, at Section 6.5(f)(iv)).

1136 Id.

1137 Response Letter III at 10 (citing to Appendix D, Section 8.2 (providing that “the Central Repository must provide for direct queries, bulk extraction, and download of Data for all regulatory users.”)).

1138 Response Letter III at 11.

Regarding the security of extracted CAT Data, the Participants stated that they “recognize the security concerns raised by bulk data extracts and any Participant-controlled systems (e.g., Participant sandboxes residing in the Plan Processor’s cloud or a Participant’s local system) used to store and analyze such data extracts, but the Participants believe that requiring the Participants to adopt and enforce policies and procedures to address these security issues appropriately addresses these concerns without diminishing the surveillance benefits of the CAT.”¹¹³⁹ The Participants noted that the Plan requires the Participants to “establish, maintain and enforce written policies and procedures reasonably designed . . . to ensure the confidentiality of the CAT Data obtained from the Central Repository.”¹¹⁴⁰ Accordingly, the Participants stated that Participants must have policies and procedures reasonably designed to ensure the confidentiality of CAT Data obtained through bulk data extracts and maintained in the Participants’ systems.¹¹⁴¹ In their response, the Participants stated that their own security controls, not those of the Plan Processor, would apply to such systems as they would be outside the Plan Processor’s control.¹¹⁴² The Participants’ represented that their security controls would be consistent with industry standards, including security protocols that are compliant with Regulation SCI, and the Participants would periodically review the effectiveness of such controls pursuant to their policies and procedures addressing data security.¹¹⁴³

1139 Id.

1140 Id.

1141 Id.

1142 Id.

1143 Id.

Regarding the Participants' security controls, the Participants stated that the CISO would be obligated to escalate issues that could represent a security threat to CAT Data.¹¹⁴⁴ For example, the Participants stated that if the CISO observes activity from a CAT Reporter or Participant that suggests that there may be a security threat to the Plan Processor or the Central Repository, then the CISO, in consultation with the CCO, may escalate the matter to the Operating Committee.¹¹⁴⁵ The Participants stated, however, that they do not envision, that "such policy enforcement [by the CISO] would involve a regulatory enforcement role with regard to the Participants."¹¹⁴⁶ The Participants further stated that "[t]he Plan does not give the CISO the authority to engage in such regulatory enforcement."¹¹⁴⁷ Moreover, although the Plan permits the Operating Committee to impose fees for late or inaccurate reporting of information to the CAT, it does not authorize the Participants to oversee, or serve enforcement actions against, each other via the Plan Processor. Only the SEC has such authority under the Securities Exchange Act of 1934."¹¹⁴⁸

The Commission believes that ensuring the security and confidentiality of CAT Data is of utmost importance, and also notes the Participants' recognition that regulators should have flexibility in designing such surveillance systems, including the ability to access and transfer data where necessary and consistent with appropriate data security safeguards. As described above,

¹¹⁴⁴ Response Letter III at 7. Notwithstanding the foregoing example, the Participants noted that the details regarding such an escalation policy will not be determined until the Plan Processor has been selected.

¹¹⁴⁵ Id.

¹¹⁴⁶ Response Letter III at 8.

¹¹⁴⁷ Id.

¹¹⁴⁸ Id.

the Plan Processor has the specific responsibility to develop and implement policies, procedures and control structures related to the security of the CAT System.¹¹⁴⁹ The Plan Processor also is responsible for the security and confidentiality of all CAT Data received and reported to the Central Repository, including during all communications between CAT Reporters and the Plan Processor, data extraction, data manipulation and transformation, loading to and from the Central Repository, and data maintenance and storage by the Central Repository.¹¹⁵⁰ The Plan Processor also must require the establishment of secure controls for data retrieval and query reports for CAT Data reported to and stored in the Central Repository.¹¹⁵¹

While the Plan Processor is responsible for the security of the CAT Data collected by and stored in the Central Repository, the Commission agrees with commenters that once CAT Data is extracted into a Participant's regulatory surveillance system, the Plan Processor can no longer assure the security of the CAT Data because the details, requirements and rigor of the policies and procedures regarding the security of CAT Data at each Participant are beyond the direct control of the Plan Processor. This is the case whether the CAT Data is downloaded to a Participant's local server, or downloaded into a dedicated sandbox within the CAT cloud – and whether the CAT Data that is downloaded is a subset of all the CAT Data collected by the Central Repository, or the entirety of the CAT Data (i.e., cloning the entire CAT database).

Therefore, the Commission believes that if a Participant chooses to extract CAT Data, whether into its own local server environment or into its own sandbox within the CAT cloud, the Participant must have policies and procedures regarding CAT Data security that are comparable

¹¹⁴⁹ See CAT NMS Plan, supra note 5, at Section 6.1(c).

¹¹⁵⁰ See id. at Section 6.5(f)(i), (iv).

¹¹⁵¹ See id. at Section 6.5(f)(iv).

to those implemented and maintained by the Plan Processor for the Central Repository, and that each Participant must certify and provide evidence to the CISO that its policies and procedures for the security of CAT Data meet the same security standards applicable to the CAT Data that is reported to, and collected and stored by, the Central Repository. Given the necessity of ensuring the security of CAT Data that is collected by and stored in the Central Repository, the Commission believes that this is a reasonable requirement that will ensure that CAT Data is subject to the same standards of security, whether the CAT Data is downloaded by a Participant onto the Participant's local servers, or downloaded into the Participant's sandbox within the CAT cloud,¹¹⁵² and therefore, is amending the plan accordingly.¹¹⁵³

The Commission believes that it is critical to the security of the CAT Data to assign responsibility to the CISO to review the data security policies and procedures of Participants that extract CAT Data into their own systems, whether on a local server or within a sandbox within the CAT cloud, to determine whether such policies and procedures are comparable to the data security policies and procedures applicable to the Central Repository. The Commission further believes that if the CISO, in consultation with the CCO, finds that any such information security policies and procedures of a Participant are not comparable to the policies and procedures applicable to the CAT System, and the issue is not promptly addressed by the applicable Participant, the CISO, in consultation with the CCO, will be required to provide notice of any such deficiency to the Operating Committee.¹¹⁵⁴

¹¹⁵² The Commission also notes that each Participant must comply with Regulation SCI. Response Letter III at 8.

¹¹⁵³ See CAT NMS Plan, supra note 5 at Section 6.2(b)(vii).

¹¹⁵⁴ See id.

e. Use of CAT Data for Regulatory and Surveillance Purposes

One commenter stated that access to CAT Data should be restricted to Commission and SRO Staff with regulatory and oversight responsibilities.¹¹⁵⁵ Another commenter stated that the proposed model and timeframe for regulatory access to the reported data is consistent with the Commission’s broader regulatory objectives.¹¹⁵⁶ Another commenter noted that access should not be granted to the academic community.¹¹⁵⁷ On the other hand, one commenter believed that aggregated CAT Data should be made available to the public on a limited or time-delayed basis, so as to enable more creative approaches to market surveillance, foster industry collaboration, and augment regulatory efforts.¹¹⁵⁸

The Participants stated that they do not plan to make CAT Data available for use by the public (or academics or other third parties) at this time.¹¹⁵⁹ The Participants noted that there may be certain benefits to this type of expanded access, such as promoting academic evaluations of the economic costs and benefits of regulatory policy.¹¹⁶⁰ Nevertheless, the Participants believed that the privacy and security concerns raised by such public access would outweigh the potential benefits.¹¹⁶¹ The Participants stated that this conclusion is “in line with the SEC’s statements in

¹¹⁵⁵ Fidelity Letter at 4.

¹¹⁵⁶ UnaVista Letter at 4.

¹¹⁵⁷ MFA Letter at 6.

¹¹⁵⁸ Data Boiler Letter at 14.

¹¹⁵⁹ Response Letter I at 44–45.

¹¹⁶⁰ Id. at 45.

¹¹⁶¹ Id.

the adopting release for SEC Rule 613 that, in light of the privacy and security concerns, ‘it is premature to require that the NMS plan require the provision of data to third parties.’”¹¹⁶²

The Commission agrees with the Participants and believes that it is reasonable to continue to limit access to CAT Data to regulatory authorities for regulatory and surveillance use.¹¹⁶³ As previously noted, the CAT is designed to be a regulatory tool. While the Commission recognizes that there may be benefits to expanding the distribution of CAT Data, the Commission also believes that limiting the use of CAT Data for regulatory and surveillance purposes is reasonable at this time, given the vast scope of the CAT Data and need to ensure the security and confidentiality of the CAT Data.¹¹⁶⁴

Although not raised by commenters, the Commission emphasizes that under the Plan the CCO must develop and implement a notification and escalation process to resolve and remediate any alleged non-compliance with the rules of the CAT by a Participant or Industry Member, which shall include appropriate notification and order of escalation to a Participant, the Operating Committee, or the Commission.¹¹⁶⁵ The Commission expects that any additional escalation procedures outlined by the CCO, once the CCO is selected, will adhere to this process.

¹¹⁶² Id.

¹¹⁶³ Such purposes include, among other things, analysis and reconstruction of market events, market analysis and research to inform policy decisions, market surveillance, examinations, investigations, and other enforcement functions. See supra note 586.

¹¹⁶⁴ This limitation on the use of CAT Data for regulatory and surveillance purposes does not restrict the ability of a Participant from using the Raw Data that it reports for commercial or other purposes. See Section IV.D.6.k, infra.

¹¹⁶⁵ See CAT NMS Plan, supra note 5, at Section 6.2(a)(v)(L).

f. Regulation SCI

Several commenters discussed the applicability of Regulation SCI to the Central Repository.¹¹⁶⁶ One commenter stated that because the CAT is an “SCI System” and an SCI System of each of the SROs, all obligations associated with Regulation SCI must be complied with by the SROs to ensure the security and integrity of the CAT.¹¹⁶⁷ One commenter stated that Industry Members are not subject to Regulation SCI and the CAT NMS Plan should “make clear that Regulation SCI would not be expanded to apply to an Industry Members [sic] by virtue of its reporting requirements under the CAT Plan.”¹¹⁶⁸ Another commenter stated that because the CAT NMS Plan provides that the Plan Processor must be compliant with Regulation SCI requirements, compliance with Regulation SCI requirements should be “an explicit evaluation criterion as part of the selection process for the CAT Processor.”¹¹⁶⁹

The Participants noted that the Plan Processor will need to satisfy all applicable regulations involving database security, including Regulation SCI, and the Participants have discussed with the Bidders their responsibilities under Regulation SCI on numerous occasions.¹¹⁷⁰ They added they do not believe that it is appropriate that the Plan provide details

¹¹⁶⁶ See CAT NMS Plan, supra note 5, at Section 6.9(b)(xi).

¹¹⁶⁷ SIFMA Letter at 21–22; see also MFA Letter at 4.

¹¹⁶⁸ FSR Letter at 6. This commenter also noted that the Plan Processor should ensure access to the PII complies with Regulation SCI and any other applicable federal and state privacy laws. Id.

¹¹⁶⁹ SIFMA Letter at 45.

¹¹⁷⁰ Response Letter I at 58.

on how the Plan Processor will ensure that the Central Repository will comply with Regulation SCI.¹¹⁷¹

The Central Repository, as a facility of each of the Participant SROs, is an SCI Entity¹¹⁷² and the CAT System is an SCI system, and thus it must comply with Regulation SCI.¹¹⁷³ The CAT NMS Plan states that data security standards of the CAT System shall, at a minimum, satisfy all applicable regulations regarding database security, including provisions of Regulation SCI.¹¹⁷⁴ The Plan Processor thus must establish, maintain and enforce written policies and procedures reasonably designed to ensure that the CAT System has levels of capacity, integrity, resiliency, availability, and security adequate to maintain its operational capability to comply with Regulation SCI.

According to Regulation SCI, the policies and procedures must require: (i) the establishment of reasonable current and future technology infrastructure capacity planning estimates; (ii) periodic capacity stress tests of such systems to determine their ability to process transactions in an accurate, timely, and efficient manner; (iii) a program to review and keep current systems development and testing methodology for such systems; (iv) regular reviews and testing, as applicable, of such systems, including backup systems, to identify vulnerabilities pertaining to internal and external threats, physical hazards, and natural or manmade disasters;

¹¹⁷¹ Id.

¹¹⁷² An “SCI Entity” means an SCI self-regulatory organization, SCI alternative trading system, plan processor, or exempt clearing agency subject to the Commission’s Automated Review Program (“ARP”). 17 CFR 242.1000.

¹¹⁷³ An “SCI System” means all computer network, electronic, technical, or automated, or similar systems of, or operated by or on behalf of, an SCI entity that, with respect to securities, directly support trading, clearance and settlement, order routing, market data, market regulation, or market surveillance. 17 CFR 242.1000.

¹¹⁷⁴ See CAT NMS Plan, supra note 5, at Section 6.9(b)(xi).

(v) business continuity and disaster recovery plans that include maintaining backup and recovery capabilities sufficiently resilient and geographically diverse and that are reasonably designed to achieve next business day resumption of trading and two-hour resumption of critical SCI systems following a wide-scale disruption; (vi) standards that result in such systems being designed, developed, tested, maintained, operated, and surveilled in a manner that facilitates the successful collection, processing, and dissemination of market data; and (vii) monitoring of such systems to identify potential SCI events.¹¹⁷⁵ Compliance with Regulation SCI will also require the Plan Processor to periodically review the effectiveness of the policies and procedures and take prompt action to remedy deficiencies in such policies and procedures.¹¹⁷⁶

For purposes of compliance with Regulation SCI, the Commission has stated that an SCI entity's policies and procedures shall be deemed to be reasonably designed if they are consistent with current SCI industry standards, which are required to be comprised of information technology practices that are widely available to information technology professionals in the financial sector and issued by an authoritative body that is a U.S. governmental entity or agency, association of U.S. governmental entities or agencies, or widely recognized organization, although compliance with current SCI industry standards is not the exclusive means to comply with the requirements of Regulation SCI.¹¹⁷⁷ To assist SCI entities in developing policies and procedures consistent with "current SCI industry standards," Staff of the Commission issued Staff Guidance which lists examples of publications describing processes, guidelines,

¹¹⁷⁵ 17 CFR 242.1001(a)(2). "SCI event" means an event at an SCI entity that constitutes: (1) A systems disruption; (2) a systems compliance issue; or (3) a systems intrusion. 17 CFR 242.1000.

¹¹⁷⁶ 17 CFR 242.1001(a)(3).

¹¹⁷⁷ 17 CFR 242.1001(a)(4).

frameworks, or standards that an SCI entity could look to in developing reasonable policies and procedures to comply with Regulation SCI.¹¹⁷⁸ The standards under the Staff Guidance address nine subject areas, including application control; capacity planning; computer operations and production environment controls; contingency planning; information security and networking; audit; outsourcing; physical security; and systems development methodology.¹¹⁷⁹

The Commission believes that compliance with Regulation SCI will help to reduce the occurrence of systems issues; improve the resiliency of the technological infrastructure when systems problems do occur; and enhance the Commission's oversight of the Central Repository. In response to a concern by a commenter about the potential of the Plan to expand the scope of Regulation SCI, the Commission clarifies that Industry Members will not be subject to Regulation SCI by virtue of reporting audit trail data to the Central Repository. In addition, in response to the commenter that stated that the Participants should use compliance with Regulation SCI as an explicit evaluation criterion as part of the selection process for the CAT Processor, the Commission expects that the Participants will evaluate a Bidder's ability to comply with Regulation SCI as part of its Bidder evaluation process, as compliance with Regulation SCI is an explicit criteria of the CAT NMS Plan.

g. Physical Security of CAT Systems

The CAT NMS Plan requires the Plan Processor to provide a solution addressing physical security controls for corporate, data center and any leased facilities where any CAT Data is

¹¹⁷⁸ See Staff Guidance on Current SCI Standards, issued on November 19, 2014, available at <https://www.sec.gov/rules/final/2014/staff-guidance-current-sci-industry-standards.pdf>.

¹¹⁷⁹ Id.

transmitted or stored.¹¹⁸⁰ One commenter stated that the data centers housing the CAT System must, at a minimum, be SOC 2 certified with such certification annually attested to by a qualified third-party auditor that is not affiliated with the SROs or the Plan Processor.¹¹⁸¹ The Participants stated that they intended for data centers housing the CAT System to be AICPA SOC 2 certified.¹¹⁸² In addition, the Participants recommended that the auditor provision should be amended to require a qualified third-party auditor that is not an affiliate of any of the Participants or the Plan Processor.¹¹⁸³

The Commission believes that assuring the physical security of the data centers that house the CAT Data, including PII Data, is a critical component of the overall security program and the Commission believes that the Participants' recommendation to amend the standards applicable to ensure the physical security of the CAT System to reflect that it will be AICPA SOC 2 certified and audited by a qualified third-party auditor that is not an affiliate of any Participant or the Plan Processor is reasonable. The Commission therefore is amending the Plan accordingly.¹¹⁸⁴

h. Encryption of CAT Data

Commenters discussed the CAT NMS Plan's provisions regarding encryption of CAT Data, including CAT Data that is PII. One commenter stated that the CAT NMS Plan's data encryption requirements alone were not sufficient to protect CAT Data at-rest and PII, and that

¹¹⁸⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section A.4(a).

¹¹⁸¹ SIFMA Letter at 21.

¹¹⁸² Response Letter I at 58.

¹¹⁸³ Id. at 58–59.

¹¹⁸⁴ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.3.

many more detailed and technical issues must be considered for the encryption requirements for the CAT System and CAT Data to be sufficient.¹¹⁸⁵ The commenter also recommended that the CAT Plan require data to be encrypted both at-rest and in-flight, and that particularly sensitive pieces of data be isolated and compartmentalized.¹¹⁸⁶ Another commenter highlighted specific standards for in-transit data (e.g., asymmetric encryptions and transport layer security), data at-rest (e.g., NIST Special Publication 800-57), and data in-use (e.g., implementing data protection controls such as disclosing intended use and duration).¹¹⁸⁷

One commenter requested that Section 4.1.2 of Appendix D of the Plan, which addresses the encryption of CAT Data, be amended to make clear that the monitoring, alerting, auditing, and any other requirements that apply with respect to CAT Data also apply to archival CAT Data.¹¹⁸⁸ Another commenter opined that the encryption and decryption standards used by the Plan Processor should be continuously updated to meet the most stringent data encryption requirements possible, and designed to support end-to-end data encryption, with data decrypted at the desktop level.¹¹⁸⁹

¹¹⁸⁵ MFA Letter at 8.

¹¹⁸⁶ Id.; see also SIFMA Letter at 20–21 (stating that “[t]he CAT Processor should employ strong, evolving encryption and decryption standards that are continuously updated to meet the most stringent data encryption requirements possible”).

¹¹⁸⁷ FSR Letter at 5–6; see also FIF Letter at 125 (suggesting that if given the option WORM (write once, read man) technology may be convenient and cost effective).

¹¹⁸⁸ MFA Letter at 8.

¹¹⁸⁹ SIFMA Letter at 20–21.

Commenters also focused on the particular necessity of encrypting PII, both when in-transit and at-rest, to ensure it remains secure and confidential.¹¹⁹⁰ One commenter noted the CAT NMS Plan’s requirement that CAT Data provided to regulators that contains PII be “masked,”¹¹⁹¹ and stated that PII should be masked unless users have permission to view the PII contained in the CAT Data that has been requested,¹¹⁹² while another commenter believed that clarification is needed regarding the meaning of “masked” under the CAT NMS Plan.¹¹⁹³

The Participants stated that “given that all three remaining bidders propose cloud based solutions, all data will be encrypted in-flight and at-rest.”¹¹⁹⁴

The Commission notes that the CAT NMS Plan requires the Plan Processor to describe how PII encryption is performed and the key management strategy. The CAT NMS Plan also requires that PII encryption methods include a secure documented key management strategy such as the use of HSM(s).

The Commission agrees with commenters that encryption of CAT Data is a necessary and critically important means of protecting CAT Data, including PII. Therefore, given the role

¹¹⁹⁰ FSR Letter at 5; MFA Letter at 8 (also stating that “[s]trong encryption should be at the heart of the CAT NMS Plan’s efforts to protect data”).

¹¹⁹¹ FSR Letter at 4; see also CAT NMS Plan, supra note 5, at Section 6.10(c)(ii).

¹¹⁹² Id.

¹¹⁹³ FIF Letter at 135.

¹¹⁹⁴ Response Letter III at 5. The Commission notes that as filed, the CAT NMS Plan had stated that all CAT Data must be encrypted in-flight using industry best practices, and that PII must be encrypted both at-rest and in-flight; storage of unencrypted PII is not permissible; and non-PII CAT Data stored in a Plan Processor private environment is not required to be encrypted at-rest. See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.2; see also Response Letter I at 57.

that encryption plays in maintaining the security of CAT Data, the Commission believes that all CAT Data must be encrypted and is amending the Plan accordingly.¹¹⁹⁵

In response to the commenter that believed that encryption alone was not sufficient to protect CAT Data at-rest and PII, the Commission notes that the CAT NMS Plan provides several means of protecting CAT Data in addition to encryption, including provisions addressing connectivity and data transfer requirements, parameters for the storage of CAT Data in general, and PII in particular, and limitations on access to CAT Data by authorized users only. In addition, the Plan states that the Technical Specifications, which will be published one year before Industry Members must report CAT Data to the Central Repository, will include more details about the data security for CAT.¹¹⁹⁶ Thus, in response to the commenter that believed that more detailed and technical issues must be considered for the encryption requirements for the CAT System and CAT Data to be sufficient, the Commission believes that preparation and publication of the Technical Specifications referenced above commits the Participants to undertaking an analysis of security requirements, in addition to and as a supplement to, the existing encryption requirements. With respect to the issues raised by the commenter regarding the specific standards for in-transit data (including asymmetric encryptions and transport layer security), data at-rest (e.g., NIST Special Publication 800-57), and data in-use (e.g., implementing data protection controls such as disclosing intended use and duration), the Commission notes that, as amended by the Commission, the Plan requires the Participants to

¹¹⁹⁵ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.2.

¹¹⁹⁶ Id. at Section 6.9(b)(xi).

adhere to all relevant standards in the NIST Cyber Security Framework, which includes standards regarding encryption.¹¹⁹⁷

In response to the commenter that stated that encryption and decryption standards used by the Plan Processor should be continuously updated to meet the most stringent data encryption requirements possible, the Commission notes that the CAT NMS Plan provides that all CAT Data must be encrypted in-flight and at-rest using industry standard best practices, and that such industry standards may be replaced by successor publications, or modified, amended, or supplemented as approved by the Operating Committee.¹¹⁹⁸

In response to commenters that discussed the need that PII be “masked,” the Commission notes that the CAT NMS Plan mandates that all CAT Data that is returned in response to a regulatory inquiry will be encrypted, and that PII data returned shall be masked unless users have permission to view the CAT Data that has been requested.¹¹⁹⁹ The Commission believes that this requirement adds an additional, reasonable requirement that protects PII from view, unless the person seeking PII is authorized to view the PII.

i. Connectivity

One commenter stated that accessing the CAT System must be done via secure methods, that the SROs should consider mandating the usage of private lines rather than encrypted internet connectivity, and that the CAT Processor’s systems should be air-gapped from the internet,

¹¹⁹⁷ Response Letter III at 8.

¹¹⁹⁸ See CAT NMS Plan, supra note 5, at Appendix D, Sections 4.1.2 and 4.2.

¹¹⁹⁹ Id. at Section 6.10(c).

thereby eliminating access to the internet and/or any internal non-CAT systems used by the Plan Processor.¹²⁰⁰

With respect to using private lines to connect to the CAT, the Participants stated that the Plan does not require CAT Reporters to use private lines to connect to the CAT due to cost concerns, particularly for smaller broker-dealers.¹²⁰¹ Noting that the Plan requires that CAT Reporters access the CAT via a secure, encrypted connection, the Participants also cited to Appendix D which states that “CAT Reporters must connect to the CAT infrastructure using secure methods such as private lines or (for smaller broker-dealers) Virtual Private Network connection over public lines.”¹²⁰²

The Participants noted that pursuant to the Bidders’ solutions, the core CAT architecture would not be accessible via the public internet.¹²⁰³ The Participants cited to Appendix D, Section 4.1.1 of the Plan, which states that “[t]he CAT databases must be deployed within the network infrastructure so that they are not directly accessible from external end-user networks. If public cloud infrastructures are used, Virtual Private Networking and firewalls/access control lists or equivalent controls such as private network segments or private tenant segmentation must be used to isolate CAT Data from unauthenticated public access.”¹²⁰⁴

The Commission believes that the CAT NMS Plan’s provisions regarding connectivity to the Central Repository reflect a reasonable approach to ensuring secure access to the CAT Data

¹²⁰⁰ SIFMA Letter at 20.

¹²⁰¹ Response Letter III at 6.

¹²⁰² Id.

¹²⁰³ Id.

¹²⁰⁴ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.1.

residing within the Central Repository. The Commission believes that leaving the option for connection via Virtual Private Network for smaller broker-dealers is reasonable, given the potential cost of mandating use of a private line. The Commission also believes that prohibiting access to the CAT System via the public internet is appropriate, given the potential risk to the security of the CAT Data residing in the Central Repository that might be caused by allowing direct access into the CAT using an unsecure method by unauthenticated users.

j. Breach of CAT Security

Commenters also discussed the appropriate action to be taken in the event of a security breach. One commenter recommended that the Commission define a “reportable incident” that would trigger implementation of the cyber incident report plan.¹²⁰⁵ Three commenters recommended that the CAT NMS Plan’s cyber incident report plan include notification procedures in the event of a cyber incident.¹²⁰⁶ One commenter specifically stated that the Plan should require that notice of an incident be provided to the Operating Committee, affected broker-dealers, other market participants and law enforcement within a designated period of time (e.g., 24 hours).¹²⁰⁷ Another commenter agreed, noting that the Plan should provide a clear mechanism for promptly notifying all victims of a CAT data breach, including Customers.¹²⁰⁸ Similarly, another commenter recommended that the Plan Processor “release a protocol document describing the specific procedures it will take upon a breach of CAT, including the

¹²⁰⁵ MFA Letter at 8. This commenter also suggested that the Plan Processor adopt a “bug bounty program” which awards individuals who report software bugs. Id.

¹²⁰⁶ SIFMA Letter at 21; ICI Letter at 8; FSI Letter at 4.

¹²⁰⁷ SIFMA Letter at 21.

¹²⁰⁸ ICI Letter at 8; see also FSI Letter at 4 (recommending that investors be notified of a breach).

procedure for notifying [P]articipants and allowing them to suspend CAT submissions temporarily in the event of an ongoing breach.”¹²⁰⁹ This commenter also requested that the data security plan include a process for reviewing data incidents to determine what corrective actions are required to reduce the likelihood of recurrence.¹²¹⁰

Some commenters discussed who should bear the cost of a data breach. One commenter stated that Industry Members should not bear the cost of a security breach that occurs on the systems of the Commission, the Participants, the Plan Processor, Central Repository, or “in-transit” amongst the various parties.¹²¹¹ Another commenter recommended that the CAT Processor, the SROs, and the Commission indemnify the broker-dealers from any and all liability in the event of a breach that is in no part the fault of the broker-dealers.¹²¹² Two commenters added that CAT NMS, LLC should purchase an insurance policy that covers potential breaches and extends to Industry Members and their obligations vis-à-vis their clients whose CAT Data is required to be reported by the CAT Plan.¹²¹³

In response to commenters, the Participants noted that the Plan Processor is required to work with the Operating Committee to develop a breach protocol in accordance with industry practices.¹²¹⁴ However, the Participants also stated that they believe that providing more details

¹²⁰⁹ FSI Letter at 4.

¹²¹⁰ Id.

¹²¹¹ FSR Letter at 8.

¹²¹² SIFMA Letter at 22; see also FSI Letter at 5 (suggesting that the Plan Processor should bear responsibility in the event of a data breach and that the Plan Processor should expressly indemnify Participants for any costs or damages incurred as a result of a data breach occurring after they have provided data to the CAT).

¹²¹³ FSR Letter at 8; see also SIFMA Letter at 22.

¹²¹⁴ Response Letter I at 58.

on these processes or procedures raises security issues.¹²¹⁵ Moreover, the Participants noted, the CAT System will be subject to applicable regulations involving database security, including Regulation SCI and its requirement to provide notice to the Commission and to disseminate information about SCI Events to affected CAT Reporters.¹²¹⁶

With respect to breaches of the CAT System and the accompanying protocols for dealing with breaches, the Commission notes that the CAT NMS Plan provides that the Plan Processor must develop policies and procedures governing its responses to systems or data breaches,¹²¹⁷ and the Participants added that the Plan Processor will work with the Operating Committee to develop a breach protocol in accordance with industry practices.¹²¹⁸ According to the CAT NMS Plan, such policies and procedures will include a formal cyber incident response plan and documentation of all information relevant to breaches.¹²¹⁹ The cyber incident response plan will provide guidance and direction during security incidents, and may include items such as guidance on crisis communications; security and forensic procedures; Customer notifications; “playbook” or quick reference guides that allow responders quick access to key information; insurance against security breaches; retention of legal counsel with data privacy and protection expertise; and retention of a public relations firm to manage media coverage.¹²²⁰ The CAT NMS Plan further provides that documentation of information relevant to breaches should include a chronological timeline of events from the breach throughout the duration of the investigation;

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Id.

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Id.

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See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.5.

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Response Letter I at 58.

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See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.5.

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Id.

relevant information related to the breach (e.g., date discovered, who made the discovery, and details of the breach); response efforts, involvement of third parties, summary of meetings/conference calls, and communication; and the impact of the breach, including an assessment of data accessed during the breach and impact on CAT Reporters.¹²²¹

In response to commenters that requested additional detail about the CAT NMS Plan breach management protocol, such as the definition of a “reportable incident,” the Commission notes that the Plan requires the Plan Processor to develop policies and procedures to govern its responses to systems or data breaches and the Commission expects the definition of a “reportable incident” will be clearly set forth in those policies and procedures. While the Plan does not explicitly require it, in response to the commenter that requested that notice of a breach be provided to the Operating Committee, the Commission expects that the CAT NMS Plan’s cyber incident response plan will incorporate notice of the breach to the Operating Committee, because the Operating Committee is the body that manages the CAT LLC. As a Regulation SCI System, the Plan Processor must also notify the Commission in the event of an SCI Event.¹²²²

As for commenters that opined on the other parties that should be notified upon a breach, including affected parties such as Customers, the Commission notes that the Plan explicitly requires customer notifications to be included in the cyber incident response plan, and that the cyber incident response plan may list other market participants that will be notified upon a breach of the CAT System and the procedure for notifying relevant participants of the breach.¹²²³

¹²²¹ Id.

¹²²² Pursuant to Regulation SCI, the Commission must be notified within 24 hours of an SCI Event. See 17 CFR 242.1002(b).

¹²²³ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.5.

In response to the commenter that requested that the breach protocol include a process for reviewing “data incidents” to determine what corrective actions are required to reduce the likelihood of recurrence, the Commission notes that the Plan requires that the impact of the breach be assessed, and the Commission expects that such assessment will also help identify the corrective actions that must be taken to reduce the likelihood of recurrence.

In response to the several commenters that discussed issues surrounding the cost of a breach, including which parties should bear the cost of a breach, and whether the Plan Processor, the Participants and the Commission should indemnify the broker-dealers from all liability in the event of a breach that is no fault of the broker, the Commission notes that the Plan requires that the Plan Processor’s cyber incident response plan must address insurance issues related to security breaches and that as part of the discussions on insurance coverage and liability, further detail about the distribution of costs will be undertaken. The Commission believes that it is reasonable to require, at this stage, that the cyber incident response plan outline the key areas of breach management that must be addressed by the Plan Processor; further details on the breach management protocols, including details about who might bear the cost of a breach and under what specific circumstances, will follow once the Plan Processor is selected.

k. Use of Raw Data for Commercial or Other Purposes

Commenters also discussed the CAT NMS Plan’s provision permitting a Participant to use the Raw Data¹²²⁴ it reports for commercial or other purposes as long as such use is not

¹²²⁴ “Raw Data” means Participant Data and Industry Member Data that has not been through any validation or otherwise checked by the CAT System. See CAT NMS Plan, *supra* note 5, at Section 1.1. The Commission notes that the Section 6.5(h) of the CAT NMS Plan also limits the use by a Participant of the Raw Data that the Participant has reported to the Central Repository; a Participant may not use the Raw Data reported by another Participant.

prohibited by applicable law, rule or regulation.¹²²⁵ One commenter believed that the Plan should be amended to state specifically when a Participant may—or more importantly, according to the commenter, may not—use Raw Data or CAT Data for commercial purposes.¹²²⁶ This commenter also noted inconsistencies in the Participants’ commercial use of data.¹²²⁷ Specifically, the commenter noted that Section 6.5(f)(i)(A) of the Plan states that each SRO may use “the CAT Data it reports to the Central Repository for regulatory, surveillance, commercial or other purposes as permitted by applicable law, rule or regulation,” and Section 6.5(h) permits a Participant to “use the Raw Data it reports to the Central Repository for regulatory, surveillance, commercial or other purposes as otherwise not prohibited by applicable law, rule or regulation.”¹²²⁸ Another commenter stated that the CAT NMS Plan should be amended to clarify that Participants may not use data stored in the Central Repository—beyond the data that the SROs submit to the CAT—for their own commercial purposes.¹²²⁹ One commenter provided two recommendations designed to ensure that Participants do not use the CAT NMS Plan to “enlarge the scope of data that they commercialize.”¹²³⁰ First, the commenter believed that the Plan should specify that no Participant may commercialize customer identifying information, regardless of whether applicable law expressly prohibits its commercialization. Second, the Plan

¹²²⁵ ICI Letter at 10; SIFMA Letter at 31.

¹²²⁶ SIFMA Letter at 31.

¹²²⁷ Id.

¹²²⁸ Id.

¹²²⁹ KCG Letter at 9.

¹²³⁰ ICI Letter at 10.

should limit the scope of data subject to commercialization by narrowing the definition of Raw Data to include only data that a Participant must report under Rule 613 or the Plan.¹²³¹

In response to commenters, the Participants stated that they continue to believe that it is appropriate for the CAT NMS Plan to permit the Participants to use their Raw Data for commercial or other purposes.¹²³² Therefore, the Participants do not propose to prohibit such use.¹²³³ Nevertheless, to address the concern raised by a commenter that the CAT NMS Plan inconsistently uses the terms “Raw Data” and “CAT Data” in Sections 6.5(f)(i)(A) Section 6.5(h) of the CAT NMS Plan, the Participants recommended that the term “Raw Data” replace the term “CAT Data” in Section 6.5(f)(i)(A) of the Plan.¹²³⁴

As an initial matter, the Commission finds that it is reasonable to amend the Plan to replace the term “CAT Data” with “Raw Data” in Section 6.5(f)(i)(A) of the Plan, to remove any inconsistency and potential confusion. The Commission also finds that the CAT NMS Plan’s provisions regarding the use of Raw Data by a Participant is a reasonable approach to the use of audit trail data that is reported by the Participant itself. In response to the commenter’s request that the Commission define the circumstances under which a Participant cannot use its Raw Data, the Commission finds that the CAT NMS Plan’s provision that the use must not be prohibited by applicable law, rule or regulation is sufficient guidance to Participants regarding their use of the Raw Data used for commercial or other purposes.¹²³⁵ Similarly, the Commission

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Id.

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Response Letter I at 43.

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Id.

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Id.

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See CAT NMS Plan, supra note 5, at Section 6.5(f)(i)(A).

believes that the CAT NMS Plan’s definition of “Raw Data” is sufficiently clear and further addresses the comments that the Participants may expand the audit trail data that Participants may use for commercial or other purposes. The Commission notes that the CAT NMS Plan’s definition of “Raw Data” limits such data to “Participant Data” or “Industry Member Data.”¹²³⁶ In this regard, in response to the commenter with concerns about a Participant commercializing customer identifying information, the Commission notes that a Participant would never be in a position to report customer identifying information itself; therefore, a Participant could not use customer identifying information for commercial or other purposes. The Commission also believes that, pursuant to the CAT NMS Plan, the Participants may not use CAT Data for commercial purposes.

1. Ownership of CAT Data

Several commenters discussed the ownership of CAT Data. Two commenters believed that the CAT NMS Plan should be amended to indicate that broker-dealers retain ownership rights in all of the data they report to the CAT.¹²³⁷ In response to commenters, Participants stated that Rule 613 does not address broker-dealer CAT Reporters’ ownership rights with respect to the CAT Data, and the Participants do not believe that it is appropriate to address such ownership rights in the Plan.¹²³⁸

The Commission believes that it is reasonable for the CAT NMS Plan not to address ownership rights to the data that broker-dealers report to the Central Repository. The resolution of legal questions regarding ownership rights to the data that is reported to the Central

¹²³⁶ See id. at Section 1.1.

¹²³⁷ SIFMA Letter at 30; KCG Letter at 7–8.

¹²³⁸ Response Letter I at 44.

Repository by broker-dealers is not required by Rule 613; is outside the scope of Rule 613; and is not necessary to find that the Plan meets the approval standard of Rule 608.

m. Bulk Access to an Industry Member's CAT Data

A few commenters discussed whether Industry Members should be permitted access to their own reported audit trail data through bulk data exports. One commenter stated that it “would be highly beneficial for CAT Reporters to have access to their own data” to assist with error identification and correction, and stressed the importance of building such access into CAT as part of the initial design, even if CAT Reporters were not permitted such access during the initial phase of CAT.¹²³⁹ To address security concerns, the commenter suggested that retrieval of PII data should be limited to a set of CAT Reporter personnel who are responsible for entering and correcting customer information.¹²⁴⁰ Another commenter noted that broker-dealers should be permitted to access, export and use their data within the Central Repository at no charge and that “[a]llowing broker-dealers to access their own data will be beneficial for surveillance and internal compliance programs and may incentivize firms to make other internal improvements including, among other things, reducing potential errors.”¹²⁴¹ This commenter also argued that broker-dealers should not be subject to additional fees to simply retrieve data they already submitted to the CAT, noting that CAT is the only broker-dealer regulatory reporting service for

¹²³⁹ FIF Letter at 61.

¹²⁴⁰ Id.

¹²⁴¹ SIFMA Letter at 30. In this regard, this commenter noted that broker-dealers could use their CAT reported data to run complex searches and generate reports to (1) meet their regulatory surveillance requirements; (2) conduct best execution analysis; and (3) conduct transaction costs analysis. Id.

which the SROs have proposed to impose system-specific fees on broker-dealers.”¹²⁴² Another commenter stated that “[a]llowing CAT Reporters to access their own data would be beneficial for surveillance and internal compliance programs. If data access is considered as part of the initial design of the Central Repository, we believe the benefits outweigh the cost.”¹²⁴³ One commenter argued that independent software vendors also should have fair, reasonable, and non-discriminatory access, at their client’s request, to the data submitted or stored at the Central Repository on their client’s behalf.¹²⁴⁴ In support, this commenter noted that OATS permitted access to determine reporting accuracy by “matching in both directions,” so that reporters could address matching errors.¹²⁴⁵

In response to these comments, the Participants noted that during the development of the Plan, the SROs considered whether to provide Industry Members with access to their own data through bulk data exports.¹²⁴⁶ Based on the data security and cost considerations, the Participants stated that they determined that such access was not a cost-effective requirement for the CAT.¹²⁴⁷ Accordingly, the CAT NMS Plan was drafted to state that “[n]on-Participant CAT Reporters will be able to view their submissions online in a read-only, non-exportable format to facilitate error identification and correction.”¹²⁴⁸

¹²⁴² Id.; see also KCG Letter at 7.

¹²⁴³ TR Letter at 8.

¹²⁴⁴ Bloomberg Letter at 7.

¹²⁴⁵ Id. (noting further that independent software vendors could build sophisticated analytics to aid this).

¹²⁴⁶ Response Letter I at 44.

¹²⁴⁷ Id.

¹²⁴⁸ See CAT NMS Plan, supra note 5, at Appendix D, Section 10.1.

In light of the comments that the Commission received and further evaluation of the issue, however, in their response, the Participants stated that they now believe that there may be merit to providing Industry Member and their vendors with bulk access to the CAT Reporters' own unlinked CAT Data.¹²⁴⁹ For example, the Participants stated that such access may facilitate the CAT Reporters' error analysis and internal surveillance and that it may expedite the retirement of duplicative reporting systems.¹²⁵⁰ However, the Participants noted, providing bulk data access also raises a variety of operational, security, cost and other issues related to the CAT.¹²⁵¹ The Participants stated that they would need to address this additional functionality with the Plan Processor; in addition, the Participants stated that inclusion of this functionality would create additional burdens on the CAT and the Plan Processor and, therefore, may require additional funding from CAT Reporters for such access to the CAT Data.¹²⁵² Therefore, the Participants stated that they will consider this issue once the CAT is operational.¹²⁵³

The Commission recognizes the commenters' desire for bulk access to their own data for surveillance and internal compliance purposes, as well as possible error correction purposes. The Commission also recognizes the Participants' initial approach of not permitting such access for security and cost purposes, as set forth in their response. Given the complexity of initially implementing the CAT, the Commission believes that the Participants' approach that limits Industry Members to only being able to view their submissions online in a read-only, non-

1249 Response Letter I at 44.

1250 Id.

1251 Id.

1252 Id.

1253 Id.

exportable format to facilitate error identification and correction is a reasonable approach at the present time. The Commission notes the Participants' representation that they will consider offering bulk access to the audit trail data reported by Industry Members once CAT is operational. The Commission expects the Participants to fulfill this commitment and as part of their evaluation, the Commission expects that the Participants may consider whether a fee for such access would be appropriate and how such a fee might impact the funding of the CAT.¹²⁵⁴

The Commission disagrees with the commenters that recommended providing access to CAT Data for independent software vendors.¹²⁵⁵ Given the highly sensitive nature of the CAT Data, the Commission believes that it is reasonable to not allow access to parties other than the SROs and the Commission. If the Participants decide to propose granting such access after gaining experience with CAT operations, and are able to ensure the security of data, the Commission will consider, based on the analysis presented, whether granting access to CAT Reporters and other non-regulator industry members is reasonable.

The Commission also notes that, as discussed in Section IV.H, the Commission is amending Section 6.6 of the Plan to require that, within 24 months of effectiveness of the Plan, the Participants provide the Commission with a report discussing the feasibility, benefits, and risks of allowing an Industry Member to bulk download the Raw Data it submitted to the Central Repository.¹²⁵⁶

¹²⁵⁴ The Commission preliminarily believes that if the Participants decide to provide access to broker-dealer CAT Reporters, an amendment to the CAT Plan would be required as this would expand the Plan's restriction that CAT Data only be used by Participants for regulatory and surveillance purposes. See CAT NMS Plan, supra note 5, at Section 6.5(h).

¹²⁵⁵ Bloomberg Letter at 7.

¹²⁵⁶ See Section IV.H, supra.

n. Regulator Use Cases

One commenter noted that the Plan does not provide any details on how regulators will be able to perform their day-to-day analysis using CAT Data.¹²⁵⁷ Specifically, this commenter analyzed the limitations of the CAT NMS Plan in light of the regulator use cases (“Regulator Use Cases”) contained in the Adopting Release, which provided further detail about how regulators envisioned using, accessing, and analyzing audit trail data under CAT.¹²⁵⁸ This commenter made three recommendations that the commenter believed would provide additional clarity to the CAT NMS Plan: (i) the Plan should clearly specify the analytical capability requirements of the CAT to inform the SROs about the level and limits of the Central Repository’s analytical capabilities; (ii) the Plan should precisely describe the technology enhancements required by the SROs and the Commission to effectively and efficiently use the CAT Data; and (iii) the Regulator Use Cases should be a key criteria in the selection of the Plan Processor, which would require Bidders to prove that their solution is capable of facilitating regulators’ need to extract and analyze the data.¹²⁵⁹

The Commission recognizes the commenter’s concerns about the lack of details in the CAT NMS Plan regarding how regulators will be able to perform their day-to-day analysis using CAT Data, in light of the Regulator Use Cases. The Commission notes, however, that in the Adopting Release the Commission stated that it was not including the Regulator Use Cases and accompanying questions to endorse a particular technology or approach to the consolidated audit trail; rather, the Regulator Use Cases and accompanying questions were designed to aid the

¹²⁵⁷ SIFMA Letter at 32–33.

¹²⁵⁸ Id. at 31–33.

¹²⁵⁹ Id. at 33.

SROs’ understanding of the types of useful, specific information that the CAT NMS Plan could contain that would assist the Commission in its evaluation of the Plan.¹²⁶⁰ The Commission noted that its description of Regulator Use Cases includes a non-exclusive list of factors that SROs could consider when developing the NMS plan.¹²⁶¹ Thus, the Commission believes that the Regulator Use Cases were not intended to serve as a list of specific requirements regarding analytical capability or technological enhancements that should be addressed by the Participants in the CAT NMS Plan. In response to the comment that the Regulator Use Cases should be a key criteria in the selection of the Plan Processor, the Commission reiterates that the Regulator Use Cases were not intended to be used as selection criteria for the Plan but were meant to elicit the types of useful information from the bidders that would assist in the Commission in its evaluation of the CAT NMS Plan.

o. Obligations on Participants and the Commission Regarding Data Security and Confidentiality

Under the CAT NMS Plan as noticed, certain obligations are imposed, or required to be imposed by the Plan Processor upon the Participants and the Commission regarding data security and confidentiality.¹²⁶² However, Commissioners and employees of the Commission are excluded from certain of these obligations.¹²⁶³

Two commenters opined on these provisions. One stated that “the security of the confidential data stored in the Central Repository and other CAT systems must be of the highest

¹²⁶⁰ See Adopting Release, supra note 13, at 45798.

¹²⁶¹ Id.

¹²⁶² See CAT NMS Plan, supra note 5, at Sections 6.5(f)(i)(A)–(B), 6.5(f)(i)(D), 6.5(f)(iii), 6.5(f)(iv)(B), 6.5(g), Appendix D, Sections 4.1.4, 4.1.6, 11.3; see also supra Section III.25.

¹²⁶³ See CAT NMS Plan, supra note 5, at Section 6.5(f)(i)(A)–(B).

quality and that no authorized users with access to CAT Data should be exempt from any provisions regarding security requirements and standards set forth in the Plan.”¹²⁶⁴ Another commenter expressed concern that the Plan does not require Commission Staff to abide by the same security protocols for handling PII that other users of CAT Data are required to follow and urged the Commission to adopt these safeguards.¹²⁶⁵

Specifically, one commenter objected to the exclusion of Commissioners and employees of the Commission from Section 6.5(f)(i)(A) of the Plan, which provides that the Plan Processor must require individuals with access to the Central Repository to use appropriate confidentiality safeguards and to use CAT Data only for surveillance and regulatory purposes.¹²⁶⁶ In addition, the commenter argued that Section 6.5(g) of the Plan, which requires the Participants to establish and enforce policies and procedures regarding CAT Data confidentiality, should also apply to the Commission.¹²⁶⁷ Similarly, another commenter sees no reason why the Commission should not have to follow the requirements of Section 6.5(g) and emphasized that the Commission needs to follow adequate policies and procedures when handling PII.¹²⁶⁸ However, the first commenter

¹²⁶⁴ NYSE Letter at 2–4 (noting that “[i]f employees of the Commission with access to the data stored in the Central Repository or other CAT systems are subject to security standards less stringent than those applicable to other authorized users, the data obtained and held by those individuals may be subject to heightened risk of a data breach.”).

¹²⁶⁵ Garrett Letter at 1–2.

¹²⁶⁶ NYSE Letter at 3.

¹²⁶⁷ *Id.* at 3–4 (citing U.S. Government Accountability Office (“GAO”) report discussing certain weaknesses in the Commission’s information security policies).

¹²⁶⁸ Garrett Letter at 1 (noting also that computer systems at the Federal Deposit Insurance Corporation, Internal Revenue Service, Federal Reserve, and Office of Personnel Management have all recently been compromised by cyberattacks and that an April 2016 GAO report identified several weaknesses related to the SEC’s cybersecurity protocols that the Commission has not yet addressed).

noted that it “do[es] not believe that individuals performing their employment duties should be subject to personal liability and that such liability would not reduce security risks,” and objected to Section 6.5(f)(i)(B) of the Plan, which requires the submission of a “Safeguard of Information Affidavit” providing for personal liability for misuse of data.¹²⁶⁹

In response to these comments, the Participants stated that they agree that the Plan’s security program must take into consideration all users with access to CAT Data, including the Commission, and noted that Commission Staff had requested the exclusion of Commission employees and Commissioners from subsections (A) and (B) of Section 6.5(f)(i) of the Plan.¹²⁷⁰ The Participants, nevertheless, recommended removing these exclusions and applying the requirements of Section 6.5(g) to the Commission.¹²⁷¹

The Commission takes very seriously concerns about maintaining the security and confidentiality of CAT Data and believes that it is imperative that all CAT users, including the Commission, implement and maintain a robust security framework with appropriate safeguards to ensure that CAT Data is kept confidential and used only for surveillance and regulatory purposes. However, the Commission is not a party to the Plan.¹²⁷² By statute, the Commission is the regulator of the Participants, and the Commission will oversee and enforce their compliance with the Plan.¹²⁷³ To impose obligations on the Commission under the Plan would invert this structure, raising questions about the Participants monitoring their own regulator’s

¹²⁶⁹ NYSE Letter at 3 (also objecting to the terms “misuse” and “data” (rather than CAT Data) as overly broad and imprecise).

¹²⁷⁰ Response Letter I at 60.

¹²⁷¹ Id. at 60–61.

¹²⁷² See 17 CFR 242.608(a)(1) (stating that NMS plans are filed by two or more SROs).

¹²⁷³ See 17 CFR 242.608(b)(2), (c), (d); 17 CFR 242.613(h).

compliance with the Plan.¹²⁷⁴ Accordingly, the Commission does not believe it is appropriate for its security and confidentiality obligations, or those of its personnel, to be reflected through Plan provisions.¹²⁷⁵ Rather, the obligations of the Commission and its personnel with respect to the security and confidentiality of CAT Data should be reflected through different mechanisms than those of the Participants. The Commission reiterates that in each instance the purpose of excluding Commission personnel from these provisions is not to subject the Commission or its personnel to more lenient data security or confidentiality standards. Despite these differences in the origins of their respective obligations, the rules and policies applicable to the Commission and its personnel will be comparable to those applicable to the Participants and their personnel.

The Commission and its personnel are subject to a number of existing federal and Commission rules and policies regarding the security and confidentiality of information that they encounter in the course of their employment. These rules and policies apply with equal force to data that Commission personnel can access in the CAT. For example, existing laws and regulations prohibit Commission personnel from disclosing non-public information¹²⁷⁶ without

¹²⁷⁴ Such an approach also has the potential to create tension with the existing oversight of the Commission conducted by the Office of the Inspector General and the Government Accountability Office.

¹²⁷⁵ Moreover, Commission employees are generally immune from personal liability for actions performed in the course of their duties. See, e.g., Gilbert v. Digress, 756 F.2d 1455, 1458 (9th Cir. 1985) (“the bar of sovereign immunity cannot be avoided by naming officers and employees of the United States as defendants”); Clark v. Library of Congress, 750 F.2d 89, 103–04 (D.C. Cir. 1984) (absent a specific waiver by the government, sovereign immunity bars constitutional suits for money damages against government employees in their official capacity, even in cases where the employee acted outside his authority); 28 U.S.C. § 2679 (barring claims against government employees under the Federal Tort Claims Act).

¹²⁷⁶ See, e.g., 5 C.F.R. § 2635.703(b) (“Nonpublic information is information that the employee gains by reason of Federal employment and that he knows or reasonably should know has not been made available to the general public.”).

authorization.¹²⁷⁷ CAT Data available to Commission personnel will contain non-public information. Thus, Commission personnel who disclose or otherwise misuse this data would potentially be subject to criminal penalties (including fines and imprisonment), as well as disciplinary action (including termination of employment), civil injunction, and censure by professional associations (for attorneys and accountants).¹²⁷⁸ The Commission believes that the

¹²⁷⁷ See, e.g., 15 U.S.C. § 78x(b) (“It shall be unlawful for any member, officer, or employee of the Commission to disclose to any person other than a member, officer, or employee of the Commission, or to use for personal benefit, any information contained in any application, statement, report, contract, correspondence, notice, or other document filed with or otherwise obtained by the Commission (1) in contravention of the rules and regulations of the Commission under [the Freedom of Information Act], or (2) in circumstances where the Commission has determined pursuant to such rules to accord confidential treatment to such information”); 17 C.F.R. § 200.735-3(b)(2)(i) (“A member or employee of the Commission shall not . . . [d]ivulge to any unauthorized person or release in advance of authorization for its release any nonpublic Commission document, or any information contained in any such document or any confidential information: (A) In contravention of the rules and regulations of the Commission promulgated under [the Freedom of Information Act], [the Privacy Act], and [the Sunshine Act]; or (B) in circumstances where the Commission has determined to accord such information confidential treatment”); 5 C.F.R. § 2635.703(a) (“An employee shall not engage in a financial transaction using nonpublic information, nor allow the improper use of nonpublic information to further his own private interest or that of another, whether through advice or recommendation, or by knowing unauthorized disclosure.”).

¹²⁷⁸ See, e.g., 18 U.S.C. § 1905 (“Whoever, being an officer or employee of the United States or of any department or agency thereof . . . publishes, divulges, discloses, or makes known in any manner or to any extent not authorized by law any information coming to him in the course of his employment or official duties, . . . which information concerns or relates to the trade secrets, processes, operations, style of work, or apparatus, or to the identity, confidential statistical data, amount or source of any income, profits, losses, or expenditures of any person, firm, partnership, corporation, or association; . . . shall be fined under this title, or imprisoned not more than one year, or both; and shall be removed from office or employment”); 5 U.S.C. § 552a(h)(i)(1) (“Criminal penalties – Any officer or employee of an agency, who by virtue of his employment or official position, has possession of, or access to, agency records which contain individually identifiable information the disclosure of which is prohibited by this section or by rules or regulations established thereunder, and who knowing that disclosure of the specific material is so prohibited, willfully discloses the material in any manner to any person or

protections described above provide as strong a deterrent against the possible misuse of CAT Data by Commission personnel as would the submission of the “Safeguard of Information Affidavit” required by Section 6.5(f)(i)(B).¹²⁷⁹

In addition, the Commission already has robust information security policies and procedures developed in accordance with federal directives and NIST standards that prohibit the unauthorized disclosure and inappropriate use of confidential data. Moreover, the Commission will review and update, as necessary, its existing confidentiality and data use policies and procedures to account for access to the CAT, and, like the Participants, will periodically review the effectiveness of these policies and procedures and take prompt action to remedy deficiencies in such policies and procedures. Like other information security controls over information resources that support federal operations and assets, the Commission’s policies and procedures applicable to CAT must comply with the Federal Information Security Modernization Act of 2014 and the NIST standards required thereunder,¹²⁸⁰ and will be subject to audits by the SEC Office of Inspector General and the GAO.

agency not entitled to receive it, shall be guilty of a misdemeanor and fined not more than \$5,000”).

¹²⁷⁹ A comment from one Participant suggested that persons with access to the Central Repository—regardless of whether they are employed by the Plan Processor, the Commission, or a Participant—should not be subject to personal liability for the misuse of data. The Commission is not amending the Plan to remove personal liability from all categories of such persons. The inclusion in the Plan of a provision providing for personal liability for the misuse of data indicates that the Participants more broadly believe that this is an appropriate and potentially effective way of deterring misuse of data, including by their own employees. And, in the Commission’s view, the Participants’ belief is reasonable.

¹²⁸⁰ Pub. L. No. 113-283 (Dec. 18, 2014); NIST, Security and Privacy Controls for Federal Information Systems and Organizations, Special Publication 800-53, revision 4 (Gaithersburg, Md.: April 2013); NIST, Contingency Planning Guide for Federal

Notwithstanding the existence of these protections, in light of the scope and nature of CAT Data, the Commission recognizes the need to ensure that it has in place a comprehensive framework for CAT data security. Accordingly, a cross-divisional steering committee of senior Commission Staff is being formed to design policies and procedures regarding Commission and Commission Staff access to, use of, and protection of CAT Data. The policies and procedures will consider, but not be limited to, access controls, appropriate background checks, usage and data protection, as well as incident response. In developing these policies and procedures, the steering committee will, of necessity, take into account how the data collection and other systems are developed in connection with the creation of the CAT. The Commission will ensure that its policies and procedures impose protections upon itself and its personnel that are comparable to those required under the provisions in the Plan from which the Commission and its personnel are excluded.

For these reasons, the Commission does not believe that the Plan should be amended to remove the exclusion of “employees and Commissioners of the SEC” from Section 6.5(f)(i)(A)–(B) or to extend the requirements of Section 6.5(g) to the Commission. Similarly, the Commission does not believe that the requirements in Section 6.5(g) that Participants establish and enforce policies and procedures designed to ensure the confidentiality of CAT Data obtained from the Central Repository and to limit the use of such data to surveillance and regulatory purposes can or should be extended to the Commission. Moreover, the Commission is further amending the Plan, as set forth below, to remove the Commission from certain other obligations.

Information Systems, Special Publication 800-34, revision 1 (Gaithersburg, Md.: May 2010).

First, the Commission is amending the Plan to provide that Section 6.5(f)(iii) does not apply to the Commission or its personnel. As proposed, this provision provided that the Participants and the Commission must, as promptly as reasonably practicable, but in any event within twenty-four hours, report instances of non-compliance with policies and procedures or breaches of the security of the CAT to the CCO. The Commission received no comments on this provision. The Commission notes that, consistent with presidential directives and guidance from the OMB and the Department of Homeland Security United States Computer Emergency Readiness Team (“US-CERT”), its existing incident response policies and procedures require Commission employees to promptly convey any known instances of non-compliance with data security and confidentiality policies and procedures or breaches of the security of its systems to the CISO of the Commission, and this policy will apply to any instances of non-compliance or breaches that occur with respect to the CAT. The Commission’s policies and procedures regarding the CAT will also address conveying information regarding any such incidents to the CCO when appropriate.

Second, for the reasons discussed above, the Commission is amending the Plan to clarify that Section 6.5(f)(iv)(B) does not apply to the Commission or its personnel. As proposed, this provision stated that the Plan Processor must “require the establishment of secure controls for data retrieval and query reports by Participant regulatory Staff and the Commission.”¹²⁸¹ The Commission received no comments on this provision. The Commission will ensure that comparable controls governing data retrieval and query reports from the CAT will be included, as applicable, in its policies and procedures.

¹²⁸¹ See CAT NMS Plan, supra note 5, at Section 6.5(f)(iv)(B).

Third, the Commission is amending the Plan to clarify that the requirement to test changes to CAT functionality in Appendix D, Section 11.3 applies only to the Participants. As proposed, this provision stated that, with respect to changes to CAT functionality and infrastructure, the Plan Processor must “[d]efine the process by which changes are to be tested by CAT Reporters and regulators.” The Commission received no comments on this provision. For the reasons discussed above, the Commission is narrowing this provision so that it is applicable only to the Participants. However, the Commission intends to take part in the testing of changes in CAT functionality or infrastructure that would affect the way Commission personnel access and use the CAT System.

Fourth, for the reasons discussed above, the Commission is amending the Plan to exclude the Commission and its personnel from certain CAT user access provisions in Appendix D, Sections 4.1.4 and 4.1.6 of the CAT NMS Plan. The Plan, as proposed, provided that the Plan Processor shall “implement and maintain a mechanism to confirm the identity of all individuals permitted to access the CAT Data stored in the Central Repository and maintain a record of all instances where such CAT Data was accessed.”¹²⁸² Specifically, Appendix D, Section 4.1.4 of the CAT NMS Plan provides: that “[p]eriodic reports detailing the current list of authorized users and the date of their most recent access must be provided to Participants, the SEC and the Operating Committee,” that the “reports of the Participants and the SEC will include only their respective list of users,” that the “Participants and the SEC must provide a response to the report confirming that the list of users is accurate,” and that the “Plan Processor must log every instance of access to Central Repository data by users.”

¹²⁸² See CAT NMS Plan, *supra* note 5, at Section 6.5(f)(i)(D).

In addition, the CAT NMS Plan provides that “[a] full audit trail of PII access (who accessed what data, and when) must be maintained,” that “[t]he Chief Compliance Officer and the Chief Information Security Officer shall have access to daily PII reports that list all users who are entitled for PII access, as well as the audit trail of all PII access that has occurred for the day being reported on,” and that “[t]he chief regulatory officer, or other such designated officer or employee at each Participant and the Commission must, at least annually, review and certify that people with PII access have the appropriate level of access for their role.”¹²⁸³

For the reasons discussed above, the Commission is amending the Plan to exclude the Commission from the provisions that require the Commission to “provide a response to the report confirming that the list of users is accurate” and to “review and certify that people with PII access have the appropriate level of access for their role.”¹²⁸⁴ However, in accordance with Commission information security policies and procedures, the Commission will periodically review the appropriateness of CAT access by personnel and work with the Plan Processor to ensure the list of SEC users authorized to access CAT Data in the Central Repository is appropriate.

7. Personally Identifiable Information

a. Protections around PII, Regulatory Access to PII

A number of commenters discussed the Plan Processor’s provisions to protect the PII reported to and stored in the Central Repository. Two commenters noted that PII should be held

¹²⁸³ See CAT NMS Plan, *supra* note 5, at Appendix D, Section 4.1.6.

¹²⁸⁴ *Id.* at Appendix D, Sections 4.1.4 and 4.1.6.

to the “highest” or “most stringent” standards of information protection.”¹²⁸⁵ However, one commenter stated that “the protection and security of PII in CAT is “good enough.”¹²⁸⁶ Another commenter recommended that the Plan provide further details as to how PII data will be treated and confidentiality maintained, specifically during extraction and transmission of the data.¹²⁸⁷

Commenters also discussed the Plan’s provisions regarding access to PII. One commenter noted that “access to PII data should be provided only in the rarest of instances (i.e., SEC investigations for securities law violations), as regulators and other authorized users should be able to perform the majority, if not all, of their regulatory and oversight responsibilities by utilizing non-PII data, such as the CAT Customer-ID.”¹²⁸⁸ Another commenter stated that there should be controls, policies and procedures to prohibit the downloading of certain sensitive information, such as PII, and suggested limiting Participant access to sensitive data only to specific enforcement actions.¹²⁸⁹ One commenter recommended that PII data never be exported, extracted, copied or downloaded in any manner or form from the CAT environment.¹²⁹⁰ This commenter added that PII data should not be included in e-mail or other electronic

¹²⁸⁵ TR Letter at 8; SIFMA Letter at 22; see also NYSE Letter at 3 (discussing CAT Data, including PII reported to the Central Repository, and noting that the security of the confidential data stored in the Central Repository and other CAT systems must be of the highest quality).

¹²⁸⁶ Data Boiler Letter at 29 (stating “PII should properly be safeguarded . . . but nothing will be absolutely ‘bullet-proof.’”).

¹²⁸⁷ SIFMA Letter at 44 (suggesting that the Bidders should be evaluated on how their proposed solutions will meet the confidentiality requirements by a technical panel of experts with representation from broker-dealers).

¹²⁸⁸ SIFMA Letter at 22.

¹²⁸⁹ FIF Letter at 134–135.

¹²⁹⁰ SIFMA Letter at 22.

communications, and advocated for use of a special CAT information management tool.¹²⁹¹

Another commenter believed the PII should be excluded from direct query tools, reports or bulk data extraction.¹²⁹²

In their response, the Participants noted that Section 6.10(c)(i)(B) of the Plan provides that “[t]he user-defined direct queries and bulk extracts will provide authorized users with the ability to retrieve CAT Data via a query tool or language that allows users to query all available attributes and data sources.”¹²⁹³ The Participants clarified that no customer-related information, including PII, will be included in response to queries of the broader order and transaction database, nor will it be available in bulk extract form.¹²⁹⁴ Instead, the Participants stated that customer-related information, such as PII, will be stored in a separate database, which can be accessed only in accordance with heightened security protocols.¹²⁹⁵ In such case, a regulatory user would have to be specifically authorized to access the database with PII and other customer-related information.¹²⁹⁶ The Participants stated that they expect that the Plan Processor and the CISO will establish policies and procedures to identify abnormal usage of the database containing customer-related information, and to escalate concerns as necessary; and noted that

1291

Id.

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FSI Letter at 3.

1293

Response Letter III at 10.

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Id.

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See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.6.

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For example, in their Response Letter, the Participants noted that if a regulatory user received a tip about a particular person, such user, if he or she were appropriately authorized to do so, could search the customer-related information database and view unmasked information to identify the person’s Customer-ID, and then use the Customer-ID to query the broader order and transaction database to view the relevant activity for that Customer-ID. Response Letter III at 10.

the details regarding such policies and procedures will be determined once the Plan Processor has been selected.¹²⁹⁷

With respect to the standards of protection for PII, the Commission notes that the Plan Processor must adhere to the NIST Risk Management Framework and implement baseline security controls identified in NIST Special Publication 800-53, which the Commission believes, when applied properly, are sufficiently rigorous industry standards for the protection of sensitive data such as PII.¹²⁹⁸ The Commission also believes that the Participants' general approach to treating PII differently – and with more stringent protections – than other CAT Data is also reasonable, given the highly sensitive nature of PII, and the risk that an individual Customer's orders and transactions could be identified should the Central Repository's data security protections be breached. Thus, the Commission believes that the Plan's provisions which limit who can access PII and how PII can be accessed are a reasonable means of ensuring the protection of PII. Specifically, the Commission believes that requiring access to PII to follow RBAC, adhering to the "least privileged" practice of limiting access,¹²⁹⁹ restricting access to PII to those with a "need-to-know," and requiring that any login system that is able to access PII must be further secured via MFA, are reasonable.¹³⁰⁰

The Commission also believes that the Participants' approach to the use of PII is a reasonable means of protecting PII of Customers reported to the Central Repository. Specifically, the Commission believes that the Plan's provisions setting out specific parameters

¹²⁹⁷ Id.

¹²⁹⁸ See Section IV.D.6.b, supra.

¹²⁹⁹ The Commission understands that the "least privileged" practice entails limiting access to the minimal level of access to PII that will allow normal functioning.

¹³⁰⁰ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.4.

applicable to the inclusion of PII in queries, as described by the Participants, is a reasonable approach to controlling the disclosure of PII and helps to ensure that PII will only be used by regulators for regulatory and surveillance purposes and, as set out in the Plan, for market reconstruction and analysis.

The Commission notes that the Plan and the Participants' response affirms that access to PII data will only be provided to a limited set of authorized individuals, and only for the limited purpose of conducting regulatory and surveillance activities.¹³⁰¹ The Plan also contains an explicit prohibition on the ability to bulk download sensitive information such as PII, and this protection must be reinforced through the Plan Processor's controls, policies and procedures.

Thus, the Commission believes that the Plan's provisions addressing the protections of PII, and the limitations on its access and use, provide a reasonable framework for the protection of PII. While it is concluding that the Plan sets forth a reasonable framework for the protection of PII, the Commission notes that the Plan Processor will continually assess, and the CISO and Operating Committee will vigorously oversee, the adequacy of the security of CAT Data, and in particular PII, and will promptly and thoroughly address any deficiencies that are identified.¹³⁰²

¹³⁰¹ The Commission notes that regulatory uses includes, among other things, analysis and reconstruction of market events, market analysis and research to inform policy decisions, market surveillance, examinations, investigations, and other enforcement functions. See supra note 586.

¹³⁰² See CAT NMS Plan, supra note 5, at Section 6.1(o)(ii) (requiring the Plan Processor to provide the Operating Committee regular reports addressing, among other things, data security issues for the Plan Processor and the Central Repository taking into account the data security requirements set forth in Appendix D).

b. PII Scope: Customer Identifying Information and Customer Account Information

One commenter requested clarification on the scope of PII, stating “[t]he exact scope of PII should be defined, i.e., are all fields associated with a customer included as PII?”¹³⁰³ In their response, the Participants provided additional clarification on their interpretation of PII, as well as on the scope of the Plan’s protections for all customer-related information.¹³⁰⁴ Specifically, the Participants clarified that they view all customer-related information—not only PII, but also Customer Identifying Information and Customer Account Information—as the type of highly sensitive information that requires the highest level of protection under the Plan.¹³⁰⁵ The Participants further stated that because there is some inconsistency in how these terms are used in the Plan, to the extent that any statement in the Plan, including Section 6.10(c) of the Plan, and Appendices C or D thereto, are inconsistent with the above description, the Participants recommend that the Commission amend the Plan to address any potential confusion.¹³⁰⁶

The Commission agrees with the Participants and believes that the security of Customer Identifying Information and Customer Account Information, irrespective of whether it meets a common understanding of the definition of PII, should be subject to the highest standards of protection. Accordingly, the Commission is amending the definition of PII in Section 1.1 of the CAT NMS Plan to provide that PII means “personally identifiable information, including a social security number or tax identifier number or similar information; Customer Identifying Information and Customer Account Information.” The Commission believes that this

¹³⁰³ FIF Letter at 135.

¹³⁰⁴ Response Letter III at 9-10.

¹³⁰⁵ Response Letter III at 9.

¹³⁰⁶ Response Letter III at 10.

amendment is reasonable in that it will ensure that all information that identifies a Customer will be afforded the same high levels of protection as data that the Participants initially defined as PII.

c. Storage of PII

Commenters also discussed the policies and procedures addressing storage of PII as a means to enhance the security and confidentiality of PII reported to the Central Repository. A few commenters stated that PII should be stored separately from other CAT Data.¹³⁰⁷ One commenter stated that “PII must be segregated from other transactional data that will be stored by the CAT Processor.”¹³⁰⁸ Another commenter opined that, while it does not believe that the CAT NMS Plan should mandate a particular storage method, it supported requiring PII to be stored separately, given its sensitive nature and the potential for identify theft or fraud.¹³⁰⁹

In their response, the Participants clarified that they view all customer-related information (i.e., PII, including Customer Identifying Information and Customer Account Information) as highly sensitive information that requires the highest level of protection and, as such, all customer-related information will be stored in a different, physically separated architecture.¹³¹⁰

The Commission believes that the CAT NMS Plan’s provisions regarding the storage of PII set forth a reasonable framework for the security of such data. The Plan further provides that the CAT infrastructure may not be commingled with other non-regulatory systems, including

¹³⁰⁷ FSR Letter at 4; FSI Letter at 3; SIFMA Letter at 22; see also MFA Letter at 8 (stating that particularly sensitive pieces of data should be isolated or compartmentalized).

¹³⁰⁸ FIF Letter at 125. Similarly, another commenter recommended that PII data not overlap with access to the other transaction data available in the CAT. See SIFMA Letter at 23.

¹³⁰⁹ FSI Letter at 3.

¹³¹⁰ Response Letter III at 9.

being segmented to the extent feasible on a network level, and data centers housing CAT systems must be AICPA SOC-2 certified by a qualified third party auditor that is not an affiliate of any Participant or the Plan Processor.¹³¹¹

8. Implementation Schedule

The CAT NMS Plan sets forth timeframes for key CAT implementation events and milestones, such as when the Plan Processor will release the Technical Specifications, begin accepting data from Participants, begin accepting data from Industry Members for testing purposes, and when Industry Members must begin reporting to CAT.¹³¹²

a. Specificity and Timing of Implementation Milestones

One commenter stated that the CAT NMS Plan does not provide sufficient detail to allow for implementation planning.¹³¹³ Another commenter argued that the CAT development milestones are unacceptable because they do not promote the objective of facilitating improved market surveillance.¹³¹⁴

Other commenters suggested extending the implementation schedule for CAT.¹³¹⁵ One commenter suggested that there should be additional time to reassess and more carefully tailor

¹³¹¹ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.3; see also Response Letter I at 58–59.

¹³¹² See Section III.27, supra.

¹³¹³ FIF Letter at 43.

¹³¹⁴ Data Boiler Letter at 17.

¹³¹⁵ See, e.g., FSR Letter at 10 (noting that the implementation schedule should be extended to provide the industry a sufficient amount of time to comply with the new reporting structure under the CAT NMS Plan, including the ability to report CAT Data in a timely and accurate manner with a reduced error rate); FIF Letter at 7, 40–41, 45 (stating that FIF could not support the Plan’s implementation milestones as proposed and that the Plan lacks appropriate risk-mitigating strategies for CAT Reporters to cope with the “aggressive” implementation schedule and suggesting several such strategies).

the schedules and milestones that are included in the Plan to make the roll-out of the CAT as efficient as possible.¹³¹⁶ Another commenter suggested extending the implementation schedule for a period of at least six to twelve months beyond the timeframe in the Plan as filed, particularly in light of the fact that many Industry Members will be working to comply with the Department of Labor’s new fiduciary duty regulation as well as T+2 implementation during this same timeframe.¹³¹⁷ This commenter noted that such an extended implementation timetable would also allow for additional testing and synchronization, which would result in a more accurate reporting environment on the “go-live” date.¹³¹⁸ Another commenter noted that the CAT implementation schedule is more aggressive than the actual timeframes for implementing OATS for NMS or large trader reporting, which could lead to, among other things, poorly built systems and an inferior quality of data reporting.¹³¹⁹ This commenter also presented a detailed alternative implementation and milestone schedule that provides more time for Industry Members to prepare for CAT reporting.¹³²⁰

On the other hand, another commenter believed that the implementation schedule is too protracted, noting that the phased-in approach of requiring CAT reporting first from Participants

¹³¹⁶ SIFMA Letter at 23.

¹³¹⁷ FSR Letter at 10. The Commission notes that, as of the date of this Order, a T+2 standard settlement cycle has been proposed, but not adopted. See Securities Exchange Act Release No. 78962 (September 28, 2016), 81 FR 69240 (October 5, 2016).

¹³¹⁸ FSR Letter at 10.

¹³¹⁹ FIF Letter at 36.

¹³²⁰ Id. at 41–50. For example, FIF suggested that the Participants should select the Plan Processor prior to Plan approval and that the test environment should be available to CAT Reporters twelve months prior to the start of Industry Member reporting (rather than six months prior to the start of Industry Member reporting as proposed in the Plan). Id. at 42–43.

and then from Industry Members, combined with the fact that market participants typically request additional time to create systems to comply with new recordkeeping requirements, will render the CAT system incomplete for several years.¹³²¹

Several commenters addressed the CAT NMS Plan's development and testing milestones. One commenter noted that a robust testing period should be included in the implementation schedule and that currently the Plan does not allow sufficient time for thorough testing for broker-dealers or third-party service providers.¹³²² This commenter also suggested a trial period to permit industry-wide testing of CAT readiness to ensure that the Plan Processor is capable of meeting reporting and linkage requirements outlined in the Plan.¹³²³ Another commenter recommended that the CAT NMS Plan include "acceptance criteria" for the completion of each CAT development milestone to ensure that the implementation of the CAT and the completion of subsequent milestones are not hindered by poor quality at earlier development stages.¹³²⁴

This commenter further supported an earlier start to the development of the Technical Specifications and stated that the six-month period contemplated by the CAT NMS Plan for the industry to test software that will interface with the Plan Processor is insufficient, particularly for

¹³²¹ Anonymous Letter I at 3.

¹³²² SIFMA Letter at 24.

¹³²³ Id.; see also TR Letter at 6 (emphasizing the importance of the testing period and noting that the three-month period included in the Plan for testing the customer definition process and order data process is inadequate based on the commenter's experience with projects of lesser complexity than the CAT and because continuous reporting of customer and options data will be entirely new processes).

¹³²⁴ FIF Letter at 41.

third-party service providers and service bureaus.¹³²⁵ This commenter suggested, among other things, accelerating the availability of the CAT test environment to earlier in the implementation cycle and allowing a minimum of twelve months of access to the CAT test environment for the first group of Industry Member reporters.¹³²⁶ Another commenter proposed a twelve-month testing period with clear criteria established before moving into production, including coordinated testing across industry participants and the vendors that support them.¹³²⁷ This commenter also noted that the testing plans that will be used for any potential move to T+2 would be useful in developing industry testing for the CAT and that error rates should be consistent with OATS for reports that are currently reported to OATS.¹³²⁸ This commenter further suggested that robust testing that mirrors production will be necessary to ensure that the Plan Processor is capable of meeting the reporting and linkage requirements outlined in the Plan.¹³²⁹

In response to these commenters, the Participants explained that in light of their experience with testing timelines for other system changes, discussions with the Bidders, and other considerations, they continue to believe that the Plan sets forth an achievable testing timeline.¹³³⁰ The Participants also acknowledged the importance of the development process for

¹³²⁵ Id. at 37–38; see also id. at 38–39 (highlighting other development and testing issues, noting in particular that linkage testing across multiple CAT Reporters is one of the most complex pieces of logic for the CAT System and CAT Reporters).

¹³²⁶ FIF Letter at 39.

¹³²⁷ TR Letter at 6.

¹³²⁸ Id.

¹³²⁹ Id. at 2.

¹³³⁰ Response Letter I at 39.

the Technical Specifications for all CAT Reporters and noted that they have emphasized this as a high priority with the Bidders.¹³³¹

The Participants stated that they “do not propose to amend the Plan to reflect an expedited schedule for the Industry Member Technical Specifications.”¹³³² In addition, the Participants indicated that while strategies to mitigate any risks in meeting the implementation milestones will be a necessary part of promoting the successful implementation of the CAT, they believe that formulating specifics regarding risk mitigation strategies will depend on the selected Plan Processor and its solution.¹³³³ Therefore, the Participants stated their belief that such risk mitigation strategies will be addressed as a part of the agreement between the Plan Processor and the CAT LLC, and implemented thereafter.¹³³⁴

The Commission agrees that prompt availability of Technical Specifications that provide detailed instructions on data submission and a robust period of testing CAT reporting functionality are important factors in ensuring that Industry Members are able to timely transition to CAT reporting and accurately report data to the Central Repository. In this regard, the Commission expects the Participants to ensure that the Technical Specifications will be published with sufficient time for CAT Reporters to program their systems, and strongly encourages the Participants and the Plan Processor to provide the earliest possible release of the initial Technical Specifications for Industry Member reporting and to begin accepting Industry Member data for testing purposes as soon as practicable. In addition, the Commission is

¹³³¹ Id. at 41.

¹³³² Id.

¹³³³ Id. at 39.

¹³³⁴ Id.

amending Appendix C, Section C.10 of the Plan to ensure that the completion dates for the Technical Specifications, testing, and other development milestones designate firm outer limits, rather than “projected” completion dates, for the completion of these milestones. For example, as amended, the Plan will provide that the Plan Processor will begin developing Technical Specifications for Industry Member submission of order data no later than fifteen months before Industry Members are required to begin reporting this data, and will publish the final Technical Specifications no later than one year before Industry Members are required to begin reporting. Moreover, the Commission is amending Appendix C, Section C.10 of the Plan to clarify that the CAT testing environment will be made available to Industry Members on a voluntary basis no later than six months prior to when Industry Members are required to report data to the CAT and that more coordinated, structured testing of the CAT System will begin no later than three months prior to when Industry Members are required to report data to the CAT.

The Commission acknowledges that the transition to CAT reporting will be a major initiative that should not be undertaken hastily, that Industry Members and service bureaus will need sufficient time to make the preparations necessary to comply with the reporting requirements of the Plan and the Technical Specifications, and the importance of thorough testing. However, the Commission does not believe that the Plan’s Technical Specification and testing timeframes are unachievable. Therefore, the Commission believes it is premature—one year before the Technical Specifications for Industry Members will be finalized, eighteen months before testing will begin, and before any problem with achieving these milestones has actually arisen—to consider amending the CAT NMS Plan to mandate a more protracted implementation schedule.

Similarly, the Commission continues to believe that the implementation dates that are explicitly provided in Rule 613—for example, that Industry Members and Small Industry Members will begin reporting Industry Member data to the Central Repository within two or three years, respectively, of Plan approval¹³³⁵—are reasonable. As discussed above, the Plan provides appropriate interim milestones, such as iterative drafts of the Technical Specifications and a testing period, which will help prepare Industry Members to transition to CAT reporting pursuant to the implementation schedule set forth in the CAT NMS Plan. No issues complying with these dates have actually arisen, and the Commission is not altering these dates at this time.¹³³⁶ In addition, with respect to the comment that strategies to mitigate the risks imposed by an “aggressive” implementation schedule—such as delays, poorly built systems, and an inferior quality of data reporting—should be included in the Plan, the Commission agrees with the Participants that formulating detailed risk mitigation strategies will depend upon the selected Plan Processor and its specific solution and will be addressed in the agreement between the Plan Processor and CAT NMS, LLC. Therefore, the Commission is not amending the Plan to require specific risk mitigation strategies at this time.

¹³³⁵ 17 CFR 242.613(a)(3).

¹³³⁶ See also Adopting Release, supra note 14, at 45744, 45805 (stating that phasing CAT implementation to allow broker-dealers to begin reporting to the CAT after the SROs will “allow members additional time to, among other things, implement the systems and other changes necessary to provide the required information to the [C]entral [R]epository, including capturing customer and order information that they may not have previously been required to collect” and that “the Commission encourages plan sponsors to propose in the NMS plan a requirement that small broker-dealers report data to the [C]entral [R]epository within three years after effectiveness of the NMS plan, as the Commission believes that providing small broker-dealers a longer implementation time should assist such broker-dealers in identifying the most cost-effective and the most efficient manner in which to procure third-party software or make any systems modifications or other changes to comply with Rule 613.”).

b. Impact of Technical Specifications on Implementation Milestones

In addition, several commenters suggested that reasonable timeframes for implementing the CAT can only be established once the Plan Processor publishes—and CAT Reporters review—the Technical Specifications.¹³³⁷ Similarly, one commenter suggested that the CAT NMS Plan should establish a milestone for amending the CAT NMS Plan based on a review of the final Technical Specifications and that these amendments should set forth the CAT implementation schedule.¹³³⁸ Another commenter argued that the Plan does not currently include critical information, such as interface details and other key technical specifications, and that broker-dealers must understand these specifications in order to establish a reasonable implementation schedule.¹³³⁹

Several commenters suggested that the implementation schedule should be designed to provide more time for iterative interactions between Industry Members and the Plan Processor in terms of developing and executing system specifications, particularly as those specifications

¹³³⁷ SIFMA Letter at 23–24; FSR Letter at 10 (stating that the release of final Technical Specifications should drive the implementation timeline and that Industry Members should be provided with the Technical Specifications and given an opportunity to review and provide feedback to the Plan Processor in an effort to determine an appropriate implementation schedule); TR Letter at 3–6 (stating that rule-making should begin once final Technical Specifications are published and noting that, in keeping with the SEC’s Equity Market Structure Advisory Committee’s Rule Change Implementation timing recommendation, the timing of CAT implementation should be based on a review of the Technical Specifications); FIF Letter at 6–7 (recommending that an implementation schedule be established only after publication of the Technical Specifications and that the process for SRO and Commission rulemaking should begin upon publication of the final Technical Specifications).

¹³³⁸ See TR Letter at 6.

¹³³⁹ SIFMA Letter at 23–24.

relate to listed options transactions and customer information.¹³⁴⁰ In addition, one commenter suggested that a technical committee should be established to work with the Plan Processor on refining the specifications and making necessary adjustments or accommodations as the specifications are developed and implemented.¹³⁴¹ Another commenter suggested including a “Specifications Date” in the NMS Plan, which would be the date by which final Technical Specifications are released, at which point the industry would work with the Plan Processor to assess implementation timeframes.¹³⁴² This commenter also urged the Commission to take a data-driven approach to implementation timing, leveraging prior experience with OATS, EBS and large trader reporting to fashion an implementation plan that is achievable.¹³⁴³

Two commenters suggested that the Participants and the Commission, prior to the creation of the Technical Specifications, should provide the Plan Processor with additional detail on how they intend to use trade and order data.¹³⁴⁴ These commenters argued that this will ensure that the CAT is designed to provide all the functionality of existing systems with the initial implementation of CAT.¹³⁴⁵

In their response, the Participants explained that while the Technical Specifications will be important drivers of the implementation timeline, Rule 613 mandates certain compliance

¹³⁴⁰ Id. at 24; see also FIF Letter at 7, 40–41 (noting that there should be more time for testing and iterative specification reviews for CAT reporting).

¹³⁴¹ SIFMA Letter at 24.

¹³⁴² TR Letter at 5.

¹³⁴³ Id. at 6.

¹³⁴⁴ FIF Letter at 6; TR Letter at 3.

¹³⁴⁵ FIF Letter at 6; TR Letter at 3–4.

dates.¹³⁴⁶ According to the Participants, delaying the assessment and definition of implementation milestones until the availability of the Technical Specifications would jeopardize the ability of the Participants to meet their obligations under Rule 613.¹³⁴⁷ However, the Participants also explained that “the steps leading up to the compliance dates set forth in SEC Rule 613 can be tailored to the Technical Specifications” leaving room to accommodate specific developments related to the Technical Specifications.¹³⁴⁸ The Participants also expect the Plan Processor to provide more specific guidance as to steps toward implementation with the Technical Specifications and, to the extent that such guidance would require an amendment to the Plan’s implementation timelines, the Participants will propose to amend the Plan accordingly.¹³⁴⁹ With respect to the comments recommending an iterative process between broker-dealers and the Plan Processor in developing final Technical Specifications, the Participants noted that the Plan, as drafted, already contemplates the publication of iterative drafts as needed before the final Technical Specifications are published.¹³⁵⁰

As noted, the Commission does not believe it is necessary to tie completion dates for CAT implementation events or milestones to the release and review of Technical Specifications. The Commission believes that setting forth specific timeframes in the CAT NMS Plan for completing the various CAT implementation stages and tying these timeframes to the Effective Date rather than to subsequent events such as the release, review, or finalization of the Technical

¹³⁴⁶ Response Letter I at 39–40.

¹³⁴⁷ Id. at 40.

¹³⁴⁸ Id.

¹³⁴⁹ Id.

¹³⁵⁰ Id. at 41.

Specifications, is a reasonable approach to achieve a timely implementation of the CAT.

Therefore, and the Commission is not deferring or reducing the specificity of these timeframes at this time.

In response to the comments suggesting that the Plan should provide for a more iterative process between Industry Members and the Plan Processor in the development of the Technical Specifications, as the Participants' response pointed out, the CAT NMS Plan provides that the Plan Processor will publish iterative drafts of the Technical Specifications as needed prior to the publication of the final Technical Specifications.¹³⁵¹ However, the Commission recognizes the importance of workable Technical Specifications, and notes that the Plan requires the Participants and the Plan Processor to work with Industry Members in an iterative process, as necessary, to develop effective final Technical Specifications.¹³⁵²

Regarding the comment that the Participants and the Commission should provide the Plan Processor, prior to the creation of the Technical Specifications, with additional details on how they use trade and order data, the Commission understands that the Participants have provided the Bidders with their use cases and those of the Commission¹³⁵³ and have indicated that they will "work with the Plan Processor and the industry to develop detailed Technical Specifications."¹³⁵⁴ The Commission and its Staff will work with the Participants and the Plan Processor to facilitate the development and implementation of the Technical Specifications and

¹³⁵¹ See CAT NMS Plan, supra note 5, at Appendix C, Section C.10(b).

¹³⁵² See also Section IV.D.15, infra.

¹³⁵³ See Response Letter II at 27 ("[T]he Participants have provided the Bidders with specific use cases that describe the surveillance and investigative scenarios that the Participants and the SEC would require for the CAT.").

¹³⁵⁴ See id. at 21.

the CAT System more broadly, including by providing the Plan Processor with appropriate information on its current and prospective use of trade and order data.

c. Phasing of Industry Member Reporting

The CAT NMS Plan provides that Small Industry Members—broker-dealers whose capital levels are below a certain limit defined by regulation—must report Industry Member Data to the Central Repository within three years of the Effective Date, as opposed to the two years provided to other Industry Members.¹³⁵⁵

Several commenters noted the impact the CAT NMS Plan’s implementation schedule would have on small broker-dealers, clearing firms, and service bureaus. One commenter emphasized the need for sufficient lead time to enable small firms previously exempt from OATS reporting to establish the internal structure, technical expertise, systems, and contractual arrangements necessary for CAT reporting.¹³⁵⁶ Other commenters suggested that only those firms that are exempt or excluded from OATS reporting obligations—rather than Small Industry Member firms based on capital levels as set forth in the CAT NMS Plan—should have an additional year to begin reporting to CAT, arguing that such a change would allow existing systems to be retired earlier at a significant cost savings.¹³⁵⁷ Similarly, another commenter noted

¹³⁵⁵ See Section III.27, supra.

¹³⁵⁶ SIFMA Letter at 23.

¹³⁵⁷ TR Letter at 3–4 (recommending that the definition of Small Industry Member be based on FINRA Rules 7470 and 7410(o)); see also Wachtel Letter at 1–2 (arguing that OATS-exempt firms should be granted Small Industry Member status and that metrics other than capital level such as number of registered persons, revenue, or number of orders routed may be better ways of assessing a firm’s actual activity level and market impact); FIF Letter at 49 (supporting the Plan’s approach to require Participants to report to the CAT first but suggesting that CAT reporting obligations be phased in first for OATS reporters and then non-OATS reporters, or, in the alternative, phasing reporting obligations based on functionality, such as equities, options and allocations); Section V.F.2.b, infra.

the impact the phased implementation schedule would have upon third-party vendors, service bureaus, and correspondent clearing firms with both large and small clients, and suggested that dividing Industry Members based on whether or not they currently report to OATS is preferable to the capital level-based division proposed in the CAT NMS Plan.¹³⁵⁸

In response to these comments, the Participants explained their understanding that the Commission permitted additional compliance time for smaller firms because “small broker-dealers may face greater financial constraints in complying with Rule 613 as compared to larger broker-dealers” and that the Participants have based the implementation timeline on that framework.¹³⁵⁹ However, the Participants explained that they believe that Rule 613 and the Plan already permit Small Industry Members to commence reporting to the CAT when large Industry Members begin reporting to the CAT on a voluntary basis.¹³⁶⁰ In addition, the Participants stated that accelerating the reporting requirements for all Small Industry Members that are OATS reporters to require them to begin reporting to the Central Repository two years after Plan approval, when Large Industry Members are required to report, may enable FINRA to retire OATS on a more expedited basis and that the Participants will consider including in their Compliance Rules a requirement to accelerate reporting for Small Industry Members that are OATS reporters.¹³⁶¹

The Commission acknowledges that the capital-level based definition contained in the Plan is not the only way to define Small Industry Members for the purposes of the

¹³⁵⁸ FIF Letter at 40 (suggesting, in the alternative, that the CAT NMS Plan should permit Small Industry Members to report concurrently with Large Industry Members).

¹³⁵⁹ Response Letter II at 19–20 (citing Adopting Release).

¹³⁶⁰ Id.

¹³⁶¹ Id.

implementation schedule. However, this definition is derived from Exchange Act Rule 0–10,¹³⁶² which defines small entities under the Exchange Act for purposes of the Regulatory Flexibility Act, and reflects an “existing regulatory standard that is an indication of small entities for which regulators should be sensitive when imposing regulatory burdens.”¹³⁶³ In addition, the group of firms that do not currently report to OATS is diverse, and includes some large broker-dealers and entities that—although they are not FINRA members and hence do not have regular OATS reporting obligations—nevertheless engage in a significant volume of trading activity.¹³⁶⁴ Therefore, the Commission continues to believe, at this time, that the definition of Small Industry Member in the Plan is a reasonable means to identify market participants for which it would be appropriate to provide, and that would benefit from, an additional year to prepare for CAT reporting due to their relatively limited resources.

In addition, the Commission encourages the Participants and the Plan Processor to work with Small Industry Members that are also OATS reporters to enable them to begin reporting to CAT, on a voluntary basis, at the same time that large Industry Members are required to begin reporting, particularly if the Participants believe that this would facilitate more expeditious retirement of OATS. Accordingly, the Commission is amending Appendix C, Section C.9 of the Plan to require the Participants to consider, in their rule change filings to retire duplicative systems,¹³⁶⁵ whether the availability of certain data from Small Industry Members two years after the Effective Date would facilitate a more expeditious retirement of duplicative systems. In

¹³⁶² 17 CFR 240.0–10.

¹³⁶³ Adopting Release, supra note 14, at 45804.

¹³⁶⁴ See Notice, supra note 5, at 30715, 30793.

¹³⁶⁵ See Section IV.D.9.a(1), infra.

addition, the Commission notes that FINRA is considering whether it can integrate CAT Data with OATS data in such a way that “ensures no interruption in FINRA’s surveillance capabilities,” and that FINRA will consider “exempting firms from the OATS Rules provided they report data to the Central Repository pursuant to the CAT NMS Plan and any implementing rules.”¹³⁶⁶ The Commission encourages the other Participants to consider similar measures to exempt firms from reporting to existing systems once they are accurately reporting comparable data to the CAT and to enable the usage of CAT Data to conduct their regulatory activities.¹³⁶⁷ The Commission believes that this approach will reduce or eliminate the duplicative reporting costs of Industry Members prior to the commencement of Small Industry Member reporting.

The Commission remains open to other approaches to phasing in CAT reporting obligations that will promote the earlier retirement of reporting systems that will be rendered duplicative by the CAT. However, for the reasons discussed above, the Commission believes that, at this time, the Plan’s definition of Small Industry Member is reasonable, and is therefore not amending the Plan to change this definition or to otherwise change the phased approach to CAT implementation.

¹³⁶⁶ See CAT NMS Plan, *supra* note 5, at Appendix C, Section C.9.

¹³⁶⁷ See Section IV.D.9.a(1), *infra* (requiring the Participants to consider, in their rule change filings to retire duplicative systems, whether individual Industry Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy and reliability standards).

9. Retirement of Existing Trade and Order Data Rules and Systems

a. SRO Rules and Systems¹³⁶⁸

As discussed above, the CAT NMS Plan provides that the Participants will conduct analyses of which existing trade and order data rules and systems require the collection of information that is duplicative, partially duplicative, or non-duplicative of CAT.¹³⁶⁹ Among other things, the Participants, in conducting these analyses, will consider whether information collected under existing rules and systems should continue to be collected or whether that information should be incorporated into CAT, and, in the case of retiring OATS, whether the Central Repository contains complete and accurate CAT Data that is sufficient to ensure that FINRA can effectively conduct surveillance and investigations of its members for potential violations of FINRA rules and federal laws and regulations.¹³⁷⁰ Under the Plan, as proposed, each Participant should complete its analysis of which of its systems will be duplicative of CAT within twelve months of when Industry Members are required to report to the Central Repository, and should complete its analyses of which of its systems will be partially duplicative and non-duplicative of CAT within eighteen months of when Industry Members are required to report to the Central Repository, although these timeframes could be extended if the Participants determine that more time is needed.¹³⁷¹ In addition, the Plan requires each Participant to analyze the most appropriate and expeditious timeline and manner for eliminating duplicative and partially duplicative rules and systems and to prepare rule change filings with the Commission

¹³⁶⁸ See also Section V.F.2.b, infra (discussing comments on the costs of duplicative reporting).

¹³⁶⁹ See Section III.20, supra.

¹³⁷⁰ Id.

¹³⁷¹ Id.

within six months of determining that an existing system or rule should be modified or eliminated.¹³⁷²

(1) Timing

Several commenters addressed the timeframes proposed by the Participants for retiring systems that will be rendered duplicative by CAT. One commenter noted that the CAT NMS Plan does not contain a detailed approach for retiring duplicative reporting systems and thereby fails to meet the directives of Rule 613.¹³⁷³ This commenter suggested that the CAT NMS Plan should be amended to provide a detailed framework for elimination of reporting systems that will be rendered duplicative and outdated by CAT implementation, and to set forth a prioritized timetable for retirement of such duplicative systems.¹³⁷⁴ Similarly, another commenter expressed disappointment regarding the plan to eliminate duplicative systems, noting that the Plan merely sets forth a “loose commitment” from the Participants to complete their analyses of which rules and systems may be duplicative of CAT, rather than an actual retirement schedule.¹³⁷⁵

Several commenters emphasized the importance of eliminating duplicative systems as soon as possible and suggested that the current proposal to allow up to two and a half years for the Participants to consider system elimination is too long in light of the additional expenses that

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Id.

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KCG Letter at 2–3; see also DAG Letter at 2.

1374

KCG Letter at 2–3.

1375

DAG Letter at 2; see also STA Letter at 1 (supporting the DAG Letter’s elimination of systems recommendations).

will be incurred during the period of duplicative reporting.¹³⁷⁶ One commenter noted that without a regulatory obligation driving systems retirement, the Participants lack an incentive to retire existing systems, and that the Plan should not enable the Participants to move to planning for fixed income or primary market transaction reporting prior to mapping out the elimination of redundant systems.¹³⁷⁷ Another commenter presented a detailed alternative schedule—with significantly more aggressive timelines—for analyzing and retiring duplicative systems.¹³⁷⁸

In addition, several commenters suggested replacing or modifying the duplicative reporting period with a “test period” or “trial period.”¹³⁷⁹ In this regard, one commenter suggested modifying the CAT NMS Plan to include a trial period of no more than six months, after which duplicative systems are retired or firms are exempted from duplicative reporting if they have met certain error rate requirements.¹³⁸⁰ Similarly, another commenter recommended replacing the duplicative reporting period with a trial period mirroring production, lasting no

¹³⁷⁶ SIFMA Letter at 5–6; Bloomberg Letter at 7; Data Boiler Letter at 16–17, 36 (noting that the timing to retire duplicative reporting systems should be “now or never” and that CAT should have a milestone target of sun-setting OATS on the first day CAT goes live); FSR Letter at 10; TR Letter at 2–3; FIF Letter at 4 (noting that lack of an aggressive, detailed and committed retirement plan will result in excessive costs for CAT Reporters); Fidelity Letter at 2, 4–5 (noting that the Plan should establish a fixed date for retiring regulatory compliance systems that overlap with the CAT or, in the alternative, duplicative rules should sunset automatically once the CAT reaches certain performance metrics).

¹³⁷⁷ SIFMA Letter at 5–6.

¹³⁷⁸ FIF Letter at 26, 31–34. For example, FIF suggests that the Participants should complete their analyses of duplicative and partially duplicative rules and systems upon approval of the CAT NMS Plan and that the Participants should file rule changes to implement rule modifications or deletions when the Technical Specifications are released. *Id.*

¹³⁷⁹ *See, e.g.*, FSR Letter at 10 (recommending the replacement of the currently contemplated duplicative reporting period with a test period of the new CAT reporting system).

¹³⁸⁰ FIF Letter at 6, 25–28, 39 (recommending that there should be no penalties, archiving requirements or regulatory inquiries related to CAT reporting during this trial period).

longer than six months, and providing that the actual launch of CAT functionality be linked to the retirement of existing systems and the end of the trial period.¹³⁸¹ Other commenters suggested that the launch of CAT should be linked to the retirement of existing reporting systems, noting that it is important to maintain a single audit trail of record to avoid duplicative reporting.¹³⁸²

One commenter suggested that the Participants should provide detailed requirements regarding retirement of existing systems to the Plan Processor after the Plan Processor is selected to ensure that the Technical Specifications include all functionality necessary to retire existing systems.¹³⁸³ Similarly, other commenters noted that the CAT should be designed in the first instance to include all data field information necessary to allow prompt elimination of redundant systems.¹³⁸⁴ One commenter noted that the CAT should be so designed even if it means that CAT includes information, products, or functionality not necessary to meet the minimum initial CAT requirements under Rule 613.¹³⁸⁵ This commenter also proposed that the CAT should be designed to allow the ready addition of data fields over time to enhance the ability to retire other systems and capture additional necessary information.¹³⁸⁶

¹³⁸¹ TR Letter at 2.

¹³⁸² FSR Letter at 10; TR Letter at 2.

¹³⁸³ TR Letter at 4.

¹³⁸⁴ SIFMA Letter at 5–6; DAG Letter at 2 (suggesting that the Technical Specifications and functional requirements should include certain data attributes to assist in retiring duplicative systems and that the inclusion of OTC equities will more readily allow for the retirement of duplicative systems) ; see also STA Letter at 1 (supporting the DAG Letter’s elimination of systems recommendations).

¹³⁸⁵ SIFMA Letter at 5–6.

¹³⁸⁶ Id. at 5–6.

One commenter outlined the steps that it believes are necessary to retire OATS and COATS.¹³⁸⁷ This commenter stated that these systems cannot be eliminated until FINRA and CBOE can seamlessly continue performing their current surveillance on their member firms and that the relevant data elements needed by FINRA and CBOE to perform the current surveillance would need to be retained as part of CAT's Technical Specifications.¹³⁸⁸

In response to the comments recommending that the Participants accelerate the timeline to identify their existing rules and systems that are duplicative of CAT requirements and that CAT should be designed in the first instance to include all data field information necessary to allow prompt elimination of such redundant systems, the Participants explained that they recognize the importance of eliminating duplicative reporting requirements as rapidly as possible.¹³⁸⁹ The Participants also stated that to expedite the retirement of duplicative systems, the Participants with duplicative systems have already completed gap analyses for systems and rules identified for retirement (in full or in part), and confirmed that data that would need to be captured by the CAT to support retirement of these systems will be included in the CAT.¹³⁹⁰ Specifically, the relevant Participants have evaluated each of the following systems/rules: FINRA's OATS Rules (7400 Series),¹³⁹¹ COATS and associated rules, NYSE Rule 410(b), PHLX Rule 1022, CBOE Rule 8.9, EBS and associated rules, C2 Rule 8.7 and CHX BrokerPlex

¹³⁸⁷ Id. at 10–12.

¹³⁸⁸ Id.

¹³⁸⁹ Response Letter II at 21.

¹³⁹⁰ Id.

¹³⁹¹ The Participants stated that this review also would cover the rules of other Participants that incorporate FINRA's OATS requirements. Response Letter II at 21 (citing NASDAQ Rule 7000A Series, BX Rule 6950 Series, PHLX Rule 3400 Series, NYSE Rule 7400 Series, NYSE Arca Equities Rule 7400 Series, NYSE MKT Rule 7400 Series).

reporting (Rule 5).¹³⁹² In addition, the Participants stated that a broader review of the Participants' rules intended to identify any other impact that the CAT may have on the Participants' rules and systems generally is ongoing.¹³⁹³ The Participants also explained that once the Plan Processor is selected, the Participants will work with the Plan Processor and the industry to develop detailed Technical Specifications that ensure that by the time Industry Members are required to report to the CAT, the CAT will include all data elements necessary to facilitate the rapid retirement of these duplicative systems.¹³⁹⁴

To reflect these efforts, the Participants recommended an acceleration of the timelines for analyzing duplicative rules and systems by recommending amendments to Appendix C of the CAT NMS Plan to change the completion dates for their analyses of: (1) duplicative rules and systems to nine to twelve months from Plan approval (rather than 12 months from the onset of Industry Member reporting) and (2) partially duplicative and non-duplicative rules and systems to nine to twelve months from Plan approval (rather than 18 months from the onset of Industry Member reporting).¹³⁹⁵ However, the Participants noted that these proposed timelines are based on the Plan Processor's appropriate and timely implementation of the CAT and the CAT Data being sufficient to meet the surveillance needs of each Participant.¹³⁹⁶

¹³⁹² Response Letter II at 21.

¹³⁹³ Id. (noting that descriptions of OATS and EBS gap analyses created on behalf of the Participants are available for public review on the CAT NMS Plan website and that Participants have worked to keep these gap analyses up-to-date by including newly-added data fields in these duplicative systems, such as the new OATS data fields related to the tick size pilot and ATS order book changes, in the gap analyses).

¹³⁹⁴ Id. at 20–21.

¹³⁹⁵ Id. at 22–26.

¹³⁹⁶ Id. at 22.

In response to the comments recommending that duplicative systems be retired on a fixed date, the Participants explained that they cannot commit to retiring any duplicative systems by a designated date because the retirement of a system depends on a variety of factors.¹³⁹⁷ For example, the Participants explained that they would need to ensure that the CAT Data is sufficiently extensive and of high quality before they could rely on it for regulatory oversight purposes and that they would be unable to retire any of their duplicative systems until any rule changes related to such systems retirements are approved by the Commission.¹³⁹⁸ The Participants also noted that the elimination of potentially duplicative requirements established by the Commission (e.g., EBS reporting pursuant to SEC Rule 17a-25 and large trader reporting pursuant to SEC Rule 13h-1) are outside the Participants' purview.¹³⁹⁹ In addition, in response to the comment that the Participants lack an incentive to retire duplicative systems, the Participants explained that they are incented to eliminate systems that would be extraneous for regulatory purposes after CAT is operational due to the significant costs Participants face in running such systems.¹⁴⁰⁰

In response to the comments suggesting the use of a trial period to transition to the CAT, the Participants stated that they recognize the concerns regarding the potential for disciplinary actions during the commencement of reporting to the CAT when, despite good faith efforts, reporting errors may develop due to the lack of experience with the CAT.¹⁴⁰¹ Accordingly, the

¹³⁹⁷ Id. at 20–21.

¹³⁹⁸ See id.

¹³⁹⁹ Id.; see also Section IV.D.9.b, infra, discussing the Commission's plans to retire certain aspects of EBS and large trader reporting and other SEC rules once CAT is operational.

¹⁴⁰⁰ Response Letter II at 20.

¹⁴⁰¹ Id. at 27.

Participants stated that they will take into consideration the lack of experience with the CAT when evaluating any potential regulatory concerns with CAT reporting during the first months after such reporting is required.¹⁴⁰² In addition, the Participants stated that they intend to work together with Industry Members to facilitate their CAT reporting; for example, the CAT's testing environments will provide an opportunity for Industry Members to gain experience with the CAT, and the Plan Processor will provide Industry Members with a variety of resources to assist them during onboarding and once CAT reporting begins, including user support and a help desk.¹⁴⁰³

The Commission acknowledges that a protracted period of duplicative reporting would impose significant costs on broker-dealers and recognizes the importance of retiring duplicative rules and systems as soon as possible and of setting forth an appropriate schedule to achieve such retirement in the CAT NMS Plan. As discussed above, although a broader review of the Participants' rules intended to identify any other impact that the CAT may have on the Participants' rules and systems generally is ongoing, the Participants have completed gap analyses for systems and rules identified for full or partial retirement, including larger systems such as OATS and COATS. The Participants have confirmed that the data needed to support the retirement of these key systems will be included in the CAT,¹⁴⁰⁴ and have proposed to accelerate the projected dates for completing these analyses of duplicative, partially duplicative, and non-duplicative rules and systems to nine to twelve months after Plan approval.

1402 Id.

1403 Id.

1404 Id. at 21.

Although the Commission appreciates these efforts to accelerate the retirement of existing data reporting rules and systems that are duplicative of the CAT, the Commission believes that stronger Plan amendments than those recommended by the Participants should be made to ensure that such rules and systems are eliminated, modified, or retired as soon as practicable after the CAT is operational so that the period of duplicative reporting is kept short. Therefore, the Commission is amending Section C.9 of Appendix C of the Plan to reflect the Participants' representation that their analyses of key duplicative systems are already complete and to provide that proposed rule changes to effect the retirement of duplicative systems, effective at such time as CAT Data meets minimum standards of accuracy and reliability, shall be filed with the Commission within six months of Plan approval.

Based on the Participants' statement in their response to comments that their gap analyses are complete with respect to the major existing trade and order data reporting systems, the Commission believes that the process of assessing which systems can be retired after CAT is operational is in an advanced stage. Rather than amending the Plan to state that these analyses for duplicative systems will be complete within nine to twelve months of the Commission's approval of the CAT NMS Plan, as recommended by the Participants, the Commission believes that the milestones listed in Appendix C should include the Participants' representation that they have completed gap analyses for key rules and systems and should enumerate those specific systems because this more accurately reflects, and more prominently and clearly conveys to market participants and the public, the status of the Participants' planning for the transition from existing systems to CAT.

For these reasons, the Commission is also amending Section C.9 of Appendix C of the Plan to require the Participants to file with the Commission rule change proposals to modify or

eliminate duplicative rules and systems within six months of the Effective Date. These filings will not effectuate an immediate retirement of duplicative rules and systems—the actual retirement of such rules and systems must depend upon the availability of comparable data in CAT of sufficient accuracy and reliability for regulatory oversight purposes, as specified in the Participants’ rule change proposals. The Commission also is amending the Plan to require the Participants, in their rule change proposals, to discuss specific accuracy and reliability standards that will determine when duplicative systems will be retired, including, but not limited to, whether the attainment of a certain Error Rate should determine when a system duplicative of the CAT can be retired. Although these amendments were not suggested by the Participants, the Commission believes that the rule change filing milestone should be changed to six months from Plan approval given the status of the Participants’ gap analyses and because the actual retirement of rules and systems will only occur once CAT Data meets minimum standards of accuracy and reliability. In addition, the Commission believes that an explicit statement in the Appendix C milestones that the retirement of systems that are duplicative of CAT shall occur once CAT Data meets minimum standards of accuracy and reliability will provide greater clarity regarding how the transition from existing reporting systems to the CAT will proceed. In addition, these amendments will better align the systems retirement schedule with the broader CAT implementation schedule. For example, requiring rule change proposals to be submitted to the Commission within six months will ensure that public comments, and Commission review of these comments, which could inform the development of the Technical Specifications, will be in progress as the Technical Specifications for Industry Member data submission are being developed (i.e., at least fifteen months before Industry Members are required to report to CAT).

The Commission believes that, taken together, these amendments may facilitate an accelerated retirement of existing data reporting rules and systems that are duplicative of CAT and thus reduce the length of the duplicative reporting period as compared to the Plan as filed. Given that their requisite analytical work is already substantially complete, the Commission believes that the milestones, as amended, are achievable without a substantial increase in the burdens imposed on the Participants. Given the importance of retiring existing systems as rapidly as possible to reduce the substantial burdens on Industry Members that come with an extended period of duplicative reporting, the Commission believes that these amendments are appropriate. The CAT NMS Plan, as amended, recognizes that the Participants' requisite analytical work is already substantially complete and explicitly conditions the elimination of duplicative reporting only on the availability of accurate and reliable CAT Data that will enable the SROs to carry out their regulatory and oversight responsibilities. The amended Plan also accelerates the initiation of the formal process of retiring duplicative rules and systems by requiring that rule change filings be filed within six months of the Effective Date.

The Commission believes that the CAT NMS Plan, as amended, contains an appropriate level of detail regarding the process of retiring duplicative rules and systems. However, the Commission is not amending the Plan to include fixed or mandatory dates for the retirement of existing rules and systems at this time. As the Participants noted in their response to comments, retiring a system depends upon many factors, including the availability of sufficiently extensive and high quality CAT Data.¹⁴⁰⁵ The Commission and the SROs will continue to rely on the information collected through existing regulatory reporting systems to reconstruct market events,

¹⁴⁰⁵ Response Letter II at 20.

conduct market analysis and research in support of regulatory decision-making, and conduct market surveillance, examinations, investigations, and other enforcement functions until sufficiently complete, accurate, and reliable data is available through CAT. Therefore, precise dates for retiring these rules and systems cannot be determined prospectively. However, the Commission agrees with the Participants that they have incentives to retire extraneous systems after CAT is operational due to the desire to avoid the costs associated with maintaining such systems; the Commission believes that these incentives will mitigate any delay that would otherwise result from the difficulty of setting forth specific system retirement dates in advance.

As discussed above, the gap analyses completed by the Participants regarding the key existing trade and order data systems have confirmed that the CAT contains the data fields necessary to retire these systems, and the Commission has amended the Plan to ensure that any additional analysis related to duplicative rule and system retirement is completed in a timely manner. The Participants also explained that once the Plan Processor is selected, the Participants will work with the Plan Processor and Industry Members to develop detailed Technical Specifications that ensure that by the time Industry Members are required to report to the CAT, the CAT will include all data elements necessary to facilitate the rapid retirement of duplicative systems.¹⁴⁰⁶ The Commission agrees that the Participants should work with the Plan Processor and Industry Members in this manner and provide appropriate information about how they use trade and order data collected through existing rules and systems to ensure that the Technical Specifications are developed with these requirements in mind. In addition, with respect to the comment that CAT should be designed to permit the inclusion of additional data fields, the

¹⁴⁰⁶ Id. at 20–21.

Commission notes that the Plan contains provisions regarding periodic reviews and upgrades to CAT that could lead to proposing additional data fields that are deemed important,¹⁴⁰⁷ and does not believe any changes to the Plan are necessary.

(2) Proposed Alternative Approaches to Systems Retirement

Several commenters suggested linking the retirement of duplicative systems to the error rate or quality of data reported to CAT. For example, one commenter suggested that the CAT NMS Plan should be amended to include an exemption from duplicative reporting obligations for individual broker-dealers based on meeting certain CAT reporting quality metrics.¹⁴⁰⁸ Similarly, another commenter suggested that a “Retirement Error Rate” should be defined as the acceptable error rate for discontinuing reporting to a duplicative system, and that the Retirement Error Rate should be based on comparable data in CAT (e.g., OATS equivalent data reported to CAT should meet the reporting and quality criteria required by FINRA, but higher error rates associated with data elements that are outside the scope of existing systems should not prevent the retirement of such systems).¹⁴⁰⁹ One commenter suggested reducing the error rate as quickly as possible to facilitate the elimination of duplicative systems by including a test period to bring reporting near a 1% error rate when CAT is launched in production.¹⁴¹⁰ This commenter also noted that disparities in error rate tolerance between CAT and other existing regulatory reporting systems

¹⁴⁰⁷ See Notice, supra note 5, at 30700.

¹⁴⁰⁸ KCG Letter at 2–3.

¹⁴⁰⁹ FIF Letter at 5, 24–26; see also Bloomberg Letter at 8 (noting that the Commission should specify an appropriate error rate for CAT NMS reporting such that, once met, CAT reporters can retire superseded systems).

¹⁴¹⁰ SIFMA Letter at 6–7.

should not serve as a pretext for prolonging the lifespan of those legacy systems.¹⁴¹¹ Several commenters suggested that the error rates used for elimination of duplicative systems should be post-correction error rates and that when a firm meets the necessary standards, the Plan should allow for individual firm exemptions from duplicative reporting.¹⁴¹²

One commenter also noted that the Participants have not adequately incorporated the 14-month milestone associated with the requirement that they enhance their surveillance systems¹⁴¹³ into their milestones for the retirement of existing systems, noting that if the Participants are prepared to use CAT Data after 14 months, there should be no obstacles to retiring existing systems once the Retirement Error Rates are met.¹⁴¹⁴ If the 14-month milestone is insufficient to obligate the Participants to use CAT Data in place of existing systems, this commenter would recommend a new milestone be created such that by the end of a trial period, the Participants must use CAT Data in place of existing systems.¹⁴¹⁵

Several commenters expressed support for the Plan's exemption from OATS reporting for CAT Reporters as long as there would be no interruption in FINRA's surveillance

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Id.

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Id. at 7; see also FIF Letter at 5, 24 (corrected data should be used for error rates and individual firms should be allowed to retire duplicative systems once the Retirement Error Rate is achieved); TR Letter at 5–6; FSR Letter at 9 (stating that the error rate should only apply to post-correction data on equities). Section IV.D.11, infra, discusses the Commission's response to commenters suggesting the use of post-correction error rates.

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17 CFR 242.613(a)(3)(iv).

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FIF Letter at 6, 24–25.

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Id.

capabilities and urged the SROs to consider a similar approach for firms that meet certain error rate thresholds.¹⁴¹⁶

Similarly, one commenter suggested a “principles-based framework” for eliminating potentially duplicative systems.¹⁴¹⁷ This framework would include: (i) a “phased” elimination program in which reporters that have achieved sufficient accuracy in CAT reporting can individually retire their systems; (ii) designing the Central Repository from the outset to include the ability to implement all of the surveillance methods and functions currently used by SROs; (iii) rather than relying on a simple field-mapping exercise to determine which systems can be eliminated, considering whether all the data elements currently reported under existing systems are really needed for the types of surveillance and other analyses typically undertaken by the Participants, whether the Central Repository can use alternative methods of surveillance or analysis that do not rely on those data elements, and whether data elements currently collected by an existing reporting system that are not available in the Central Repository could be derived or computed from data that is in the Central Repository; and (iv) requiring that questions to broker-dealers regarding their reported data should be directed through the process created for the Central Repository, not through previously-established channels based on legacy systems.¹⁴¹⁸

Several commenters suggested that the Commission should impose a moratorium on changes to existing systems to coincide with the launch of CAT to enable firms to dedicate resources to the successful launch and operation of CAT rather than the maintenance of legacy

¹⁴¹⁶ DAG Letter at 2; FIF Letter at 23; see also STA Letter at 1 (supporting the DAG Letter’s elimination of systems recommendations).

¹⁴¹⁷ SIFMA Letter at 7–10.

¹⁴¹⁸ Id. SIFMA also applied this framework to the retirement of OATS, EBS, and COATS. See id. at 10–12.

systems.¹⁴¹⁹ In addition, several commenters suggested that the Plan should allow for elimination of individual systems as they become redundant or unnecessary once production commences in CAT.¹⁴²⁰

In response to the comments recommending that exemptions be granted for individual Industry Member CAT Reporters from duplicative reporting obligations if they meet a specified data reporting quality threshold, the Participants explained that this would implicate the rules of the individual Participants and would be dependent upon the availability of extensive and high quality CAT Data, as well as Commission approval of rule change proposals by the Participants and the elimination of Commission data reporting rules such as Rules 17a-25 and 13h-1.¹⁴²¹ Therefore, the Participants did not recommend an amendment to the Plan to incorporate such an exemption from the individual Participants' rules.¹⁴²²

Nevertheless, the Participants explained that they have been exploring whether the CAT or the duplicative systems would require additional functionality to permit cross-system

¹⁴¹⁹ Id. at 5–6; see also TR Letter at 5 (calling for such a moratorium to commence once the Technical Specifications are in development to ensure that the Technical Specifications are sufficiently robust and to avoid enhancing systems that will be retired); Fidelity Letter at 2, 4–5 (noting that the Plan should call for an immediate cessation of enhancements to existing broker-dealer reporting systems which will retire once the CAT is operational); KCG Letter at 3 (noting that there should be a cessation of any changes to duplicative reporting systems during the period leading up to the CAT compliance date and once broker-dealers have to begin reporting to the CAT and any such changes should be built in to the CAT); FIF Letter at 27.

¹⁴²⁰ SIFMA Letter at 5–6; FSR Letter at 10 (stating that to the extent that any subset of data collected under the CAT NMS Plan is otherwise collected under a different reporting regime, the existing reporting regime should be amended as soon as possible to remove the duplicative reporting requirement).

¹⁴²¹ Response Letter II at 26.

¹⁴²² Id.

regulatory analyses that would minimize the duplicative reporting obligations.¹⁴²³ The Participants stated that FINRA remains committed to working with the Plan Processor to integrate CAT Data with data collected by OATS if it can be accomplished in an efficient and cost effective manner.¹⁴²⁴ However, the Participants stated that FINRA anticipates that CAT Reporters who are FINRA members and report to OATS will need to report to both OATS and the CAT for some period until FINRA can ensure that CAT Data is of sufficient quality for surveillance purposes and FINRA is able to integrate CAT Data with the remaining OATS data in a way that permits it to continue to perform its surveillance obligations.¹⁴²⁵ In addition, the Participants stated that FINRA believes that requiring all current OATS reporters to submit data to the Central Repository within two years after the Commission approves the Plan may reduce the amount of time that OATS and CAT will need to operate concurrently and may help facilitate the prompt retirement of OATS.¹⁴²⁶

In response to the comment that the CAT should be designed from the outset to include the ability to implement all of the surveillance methods and functions currently used by the Participants, the Participants explained that CAT is not intended to be the sole source of surveillance for each Participant, and, therefore, would not cover all surveillance methods currently employed by the Participants.¹⁴²⁷ However, the Participants stated that, with the goal

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Id.

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Id. (noting that the Plan states that FINRA would consider exempting firms from the OATS requirements if the data submitted to the CAT is of sufficient quality for surveillance purposes and FINRA is able to integrate CAT Data with the remaining OATS data in a way that permits it to continue to perform its surveillance obligations).

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Id.

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Id.

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Id. at 27.

of using the CAT rather than duplicative systems for surveillance and other regulatory purposes, the Participants have provided the Bidders with specific use cases that describe the surveillance and investigative scenarios that the Participants and the Commission would require for the CAT, and that during the bidding process each Bidder has been required to demonstrate its ability to meet these criteria.¹⁴²⁸ In addition, the Participants noted that they have had multiple discussions with the Bidders regarding the query capabilities that each Bidder would provide, and the Participants believe that the selected Plan Processor will have the capability to provide the necessary surveillance methods and functions to allow for the retirement of duplicative systems.¹⁴²⁹ The Participants also stated that the Plan Processor will provide support, including a trained help-desk staff and a robust set of testing, validation, and error correction tools, to assist CAT Reporters as they transition to CAT reporting.¹⁴³⁰

In response to comments concerning a moratorium on changes to new systems, the Participants explained that they plan to minimize the number of changes that are rolled out to duplicative systems to the extent possible.¹⁴³¹ The Participants, however, cannot commit to making no changes to the duplicative systems as some changes may be necessary before these systems are retired—for example, changes to these duplicative systems may need to be made to address Commission initiatives, new order types or security-related changes.¹⁴³²

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Id.

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Id.

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Response Letter I at 38–39.

1431

Response Letter II at 28.

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Id.

The Commission agrees with the commenters that the accuracy of the data reported to CAT, as in part measured by CAT Reporters' Error Rate, should be a factor in determining whether and when duplicative trade and order data rules and systems should be eliminated. As discussed above, the rule change proposals regarding duplicative systems retirement that the Participants will file with the Commission within six months of the Effective Date must condition the elimination of existing data reporting systems on CAT Data meeting minimum standards of accuracy and reliability. The Commission believes that this approach may incentivize accurate CAT reporting because it could potentially allow Industry Members to retire redundant, and costly to maintain, systems sooner. The Commission believes that any such improvements in accuracy, together with the amended Plan's reduction of the period for the Participants to complete their analyses of duplicative, partially duplicative, and non-duplicative rules and its acceleration of the requirement to file system elimination rule change proposals, should facilitate an earlier retirement of duplicative systems. However, the Commission does not believe that a specific Error Rate that would automatically trigger the elimination of the collection of data through an existing, duplicative system can be set in advance, through a Plan amendment at this time. Rather, the more flexible standard set forth in the Plan, as amended—that duplicative systems will be retired as soon as possible after data of sufficient accuracy and reliability to ensure that the Participants can effectively carry out their regulatory obligations is available in CAT—recognizes the primacy of ensuring that CAT Data can be used to perform all regulatory functions before existing systems are retired, and is therefore more appropriate.

In response to the comments regarding individual exemptions from reporting to duplicative systems for Industry Members whose CAT reporting meets certain quality thresholds, the Commission supports the Participants' efforts to explore whether this can be

feasibly accomplished by adding functionality to permit cross-system regulatory analyses that would minimize duplicative reporting obligations or, in the case of OATS, integrating CAT Data with data collected by OATS. Accordingly, the Commission is amending Section C.9 of Appendix C of the Plan to require that the Participants consider, in their rule filings to retire duplicative systems, whether individual Industry Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy standards, including, but not limited to, ways in which establishing cross-system regulatory functionality or integrating data from existing systems and the CAT would facilitate such individual Industry Member exemptions. However, the Commission does not believe that it would be appropriate, at this time, to amend the Plan to require the Participants to grant such individual exemptions because, as noted by the Participants, it may not be feasible to implement the technological and organizational mechanisms that would obviate the need for duplicative reporting by ensuring that the Participants can effectively carry out their regulatory obligations using CAT Data.

In response to the comment that the CAT should be designed from the outset to include the ability to implement all of the surveillance methods and functions currently used by the Participants, the Commission notes that the Participants have indicated that they have provided the Bidders with their surveillance and investigative use cases, that each Bidder has been required to demonstrate its ability to meet these criteria, and that the selected Plan Processor will have the capability to provide the necessary surveillance methods and functions to allow for the retirement of duplicative systems. Therefore, the Commission believes that the CAT is being designed to include the ability to implement all of the surveillance methods and functions currently used by the Participants, and is not amending the Plan in response to this comment.

In response to the commenter that suggested a specific principles-based framework for retiring duplicative systems,¹⁴³³ the Commission believes that, in general, the principles outlined in the CAT NMS Plan for retiring potentially duplicative rules and systems are reasonable. The principles outlined in the Plan recognize that the Participants and the Commission will continue to rely on information collected through existing regulatory reporting systems to reconstruct market events, conduct market analysis and research in support of regulatory decision-making, and conduct market surveillance, examinations, investigations, and other enforcement functions until analogous information is available through CAT. Some period of duplicative reporting may be necessary to ensure that regulators can obtain accurate and reliable information through CAT to carry out these functions. However, the Commission also agrees that the CAT Reporter support, testing, and validation tools created for the CAT—rather than similar tools associated with legacy reporting systems—should be used to assist Industry Members as they transition to CAT reporting.¹⁴³⁴

The Commission agrees with the Participants that there cannot be a moratorium on changes to existing systems in connection with the launch of CAT. As discussed above, the Commission and the SROs use the information collected through existing regulatory reporting systems to carry out a variety of regulatory functions. Until these systems are fully retired, the Commission and the SROs will continue to rely upon these systems to obtain the information they need to perform these functions. Therefore, because changes to these systems may be necessary for the Commission or the SROs to obtain such information, the Commission does not

¹⁴³³ SIFMA Letter at 7–10.

¹⁴³⁴ See supra notes 1403, 1430 and accompanying text.

believe a moratorium should be imposed on changes to these systems. However, the Commission supports the Participants' commitment to minimizing changes to existing systems and encourages the Participants to consider the necessity of any such changes and any additional burden such changes would impose on their members during the period in which members are transitioning to CAT reporting. Accordingly, the Commission is amending Section C.9 of Appendix C of the Plan to state that between the Effective Date and the retirement of the Participants' duplicative systems, each Participant, to the extent practicable, will attempt to minimize changes to those duplicative systems.

b. Retirement of Systems Required by SEC Rules

The CAT NMS Plan also discusses specific Commission rules that potentially can be eliminated in connection with CAT implementation. Specifically, the Plan states that, based on preliminary industry analyses, large trader reporting requirements under SEC Rule 13h-1 could be eliminated. In contrast, the Plan states that “[l]arge trader reporting responsibilities on Form 13H and self-identification would not appear to be covered by the CAT.”¹⁴³⁵

One commenter suggested that the Commission should eliminate requirements such as Rule 13h-1 and Form 13H regarding large trader filings, noting that Commission Staff will have access to the same information that they are receiving through Form 13H through CAT.¹⁴³⁶

Another commenter recommended the elimination of the EBS system, under SEC Rule 17a-25,¹⁴³⁷ with respect to equity and option data.¹⁴³⁸

¹⁴³⁵ See CAT NMS Plan, supra note 5, at Appendix C, Section C.9.

¹⁴³⁶ MFA Letter at 9.

¹⁴³⁷ 17 CFR 240.17a-25.

In their response, the Participants noted that “the elimination of potentially duplicative requirements established by the SEC (e.g., SEC Rule 17a-25 regarding electronic submission of securities transactions [the EBS system] and SEC Rule 13h-1 regarding large traders) are outside the Participants’ purview.”¹⁴³⁹

The Commission acknowledges that duplicative reporting will impose significant burdens and costs on broker-dealers, that certain SEC rules require the reporting of some information that will also be collected through CAT, and that certain SEC rules may need to be modified or eliminated in light of CAT. Specifically, the Commission believes that, going forward, CAT will provide Commission Staff with much of the equity and option data that is currently obtained through equity and option cleared reports¹⁴⁴⁰ and EBS,¹⁴⁴¹ including the additional transaction data captured in connection with Rule 13h-1 concerning large traders.¹⁴⁴² Accordingly, Commission Staff is directed to develop a proposal for Commission consideration, within six

¹⁴³⁸ SIFMA Letter at 10–11. This commenter also explained that in order to retire EBS, the relevant data elements that are included in an EBS report need to be retained as part of CAT’s Technical Specifications and the accuracy of the CAT Data reported by member firms should meet an acceptable threshold for its error/rejection rate. *Id.* The commenter also noted that fixed income data, since it will not be available initially through CAT, will still need to be requested through the EBS system and that historical equity and option data will have to be retained and archived to accommodate requests for this data through EBS. *Id.*

¹⁴³⁹ Response Letter II at 21.

¹⁴⁴⁰ *See* Notice, *supra* note 5, at 30660 (discussing equity and option cleared reports).

¹⁴⁴¹ *See id.* (discussing the EBS system).

¹⁴⁴² 17 CFR 240.13h-1; *see also* Adopting Release, *supra* note 14, at 45734 (“The Commission . . . note[s] . . . that . . . aspects of Rule 13h–1 may be superseded by Rule 613. Specifically, the trade reporting requirements of Rule 13h–1 are built upon the existing EBS system. To the extent that . . . data reported to the central repository under Rule 613 obviates the need for the EBS system, the Commission expects that the separate reporting requirements of Rule 13h–1 related to the EBS system would be eliminated.”)

months of the Effective Date, to: (i) amend Rule 17a-25 to eliminate the components of EBS that are redundant of CAT, and (ii) amend Rule 13h-1,¹⁴⁴³ the large trader Rule, to eliminate its transaction reporting requirements, in each case effective at such time as CAT Data meets minimum standards of accuracy and reliability. In addition, as part of this proposal, Commission Staff will recommend whether there will continue to be any need for the Commission to make requests for equity and option cleared reports, except for historical data, once CAT is fully operational and CAT Data meets minimum standards of accuracy and reliability.¹⁴⁴⁴ The Commission notes that the EBS system will still be used to collect historical equity and options data—i.e., for executions occurring before CAT is fully operational—and data on asset classes not initially covered by CAT, such as fixed income, municipal, or other government securities, and that the components of the EBS system necessary to enable such usage will need to be retained. However, to the extent that CAT is expanded to include data on additional asset classes, the Commission will consider whether the components of the EBS system related to the retention and reporting of data on these asset classes can also be eliminated.¹⁴⁴⁵

The Commission does not agree with the comment that SEC Staff will have access through CAT to the “same information” that it receives through Form 13H.¹⁴⁴⁶ Form 13H collects information to identify a large trader, its securities affiliates, and its operations, and does

¹⁴⁴³ 17 CFR 240.13h-1(e).

¹⁴⁴⁴ At this time, the Commission does not anticipate that there will be a need to make such requests.

¹⁴⁴⁵ In addition, the Commission does not anticipate that it will make requests for equity and option cleared reports, except for historical data, once CAT is fully operational.

¹⁴⁴⁶ To cite one example, Item 4 of Form 13H requires large traders to provide an “Organizational Chart” that will not be reported under CAT.

not collect audit trail data on effected transactions. The self-identification and other Form 13H filing requirements of Rule 13h-1 will not be duplicated by or redundant of CAT.

c. Record Retention

The CAT NMS Plan states that certain broker-dealer recordkeeping requirements could be eliminated once the CAT is operational.¹⁴⁴⁷ The Plan also requires that information reported to the Central Repository be retained in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention by the Plan Processor for a period of not less than six years.¹⁴⁴⁸

One commenter suggested that record retention by the CAT should be established for periods long enough to satisfy regulatory requirements associated with other regulatory systems (e.g., the seven year record retention requirement for EBS) and that the Commission should consider the extent to which CAT reporting could fulfill recordkeeping obligations for a CAT Reporter.¹⁴⁴⁹

The Participants explained that the Plan's six-year retention period exceeds the record retention period applicable to national securities exchanges and national securities associations under SEC Rules 17a-1(b) and 17a-6(a),¹⁴⁵⁰ which require that documents be kept for at least five years.¹⁴⁵¹ The Participants further explained that they do not believe that the Plan's record retention requirements should be expanded beyond six years since such expansion would impact

¹⁴⁴⁷ See CAT NMS Plan, supra note 5, at Appendix C, Section C.9.

¹⁴⁴⁸ See id. at Section 6.5(b).

¹⁴⁴⁹ SIFMA Letter at 5–6.

¹⁴⁵⁰ 17 CFR 240.17a-1(b), 17a-6(a).

¹⁴⁵¹ Response Letter I at 27.

Bidder solutions and the maintenance costs associated with the CAT.¹⁴⁵² With respect to the comment regarding CAT Reporters using the CAT to satisfy their recordkeeping obligations, the Participants maintained that it would be inappropriate for CAT Reporters to fulfill their recordkeeping obligations by relying on the Central Repository in the initial phase of CAT reporting because permitting this use of the Central Repository would impose additional regulatory and resource obligations on the Central Repository.¹⁴⁵³ In the longer term, the Participants recognized that the Central Repository could be a useful tool to assist CAT Reporters in satisfying their recordkeeping and record retention obligations, and stated that after the implementation of CAT, the Operating Committee will review whether it may be possible for CAT Reporters to use the CAT to assist in satisfying certain recordkeeping and record retention obligations.¹⁴⁵⁴

The Commission disagrees with the suggestion from commenters that the CAT NMS Plan should be amended to extend its six-year record retention timeframe to satisfy the requirements of existing reporting systems. In addition to exceeding the five year retention period applicable to national securities exchanges and associations under Rules 17a-1(b) and 17a-6(a), as pointed out by the Participants, the Commission notes that the six-year timeframe set forth in the CAT NMS Plan reflects the six-year data retention requirement of Rule 17a-4(a).¹⁴⁵⁵ The Commission does not anticipate that any variation between the retention periods for existing systems and the CAT system will hinder the potential retirement of existing systems that are

¹⁴⁵² Id.

¹⁴⁵³ Id.

¹⁴⁵⁴ Id.

¹⁴⁵⁵ See CAT NMS Plan, supra note 5, at Appendix C, Section D.12(m).

duplicative of CAT. In addition, while the Commission believes it is important to implement the initial phases of CAT reporting first, once CAT is fully operational, the Participants, the Plan Processor, and the Commission can consider further enhancements to the CAT system, including enhancements that could potentially enable the Central Repository to satisfy certain broker-dealer recordkeeping requirements, such as those set forth in Rules 17a-3 and 17a-4.¹⁴⁵⁶

10. Primary Market Transactions and Futures

a. Primary Market Transactions

The CAT NMS Plan provides that the Participants jointly, within six months of the CAT NMS Plan’s approval by the Commission, will provide a document (the “Discussion Document”) to the Commission that will include a discussion of how Primary Market Transactions could be incorporated into the CAT.¹⁴⁵⁷ In Appendix C of the CAT NMS Plan, the Participants conclude that the Discussion Document should be limited to sub-account allocations for Primary Market Transactions.¹⁴⁵⁸ Moreover, the CAT NMS Plan does not require any specific timetable for Primary Market Transaction data to be reported to the CAT.

The Participants explained that for Primary Market Transactions there are generally two key phases: a “book building” phase and an allocation phase (which includes top-account allocations and sub-account allocations).¹⁴⁵⁹ According to the Participants, the “book building

¹⁴⁵⁶ 17 CFR 240.17(a)(3)–(4).

¹⁴⁵⁷ See CAT NMS Plan, supra note 5, at Section 6.11; see also infra note 3059. The CAT NMS Plan specifies that the Discussion Document will include details for (i) each order and Reportable Event that may be required to be provided, (ii) which market participants may be required to provide the data, (iii) the implementation timeline, and (iv) a cost estimate.

¹⁴⁵⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section A.6.

¹⁴⁵⁹ Id.

phase involves the process by which underwriters gather and assess investor demand for an offering of securities and seek information important to their determination as to the size and pricing of an issue. Using this and other information, the underwriter will then decide how to allocate IPO shares to purchasers.”¹⁴⁶⁰ The Participants’ understanding is “that these are so-called ‘top account’ allocations—allocations to institutional clients or retail broker-dealers, and that such allocations are conditional and may fluctuate until the offering syndicate terminates. Sub-account allocations occur subsequently, and are made by top-account institutions and broker-dealers prior to settlement.”¹⁴⁶¹

In reaching their decision to limit Primary Market Transactions data for CAT reporting to sub-account allocations, the Participants noted that sub-account allocations are “maintained by broker-dealers in a manner that would allow for reporting to the Central Repository without unreasonable costs and could assist the Commission and the Participants in their regulatory obligations.”¹⁴⁶² The Participants argued, however, that because top-account allocations are not firm and may fluctuate, reporting this information to the Central Repository “would involve significantly more costs which, when balanced against the marginal benefit, is not justified at this time.”¹⁴⁶³

The Commission received two comments advocating for delaying the inclusion of all Primary Market Transactions data in the CAT (and for excluding top-account allocation

¹⁴⁶⁰ Id.

¹⁴⁶¹ Id.

¹⁴⁶² Id.

¹⁴⁶³ Id.

data),¹⁴⁶⁴ and one comment supporting the inclusion of Primary Market Transaction data in the CAT, for both top-account and sub-account allocation data.¹⁴⁶⁵ Specifically, the two commenters who advocated that Primary Market Transactions should be delayed until OATS and other regulatory reporting systems are retired cited “mounting regulatory expenses” and limited and different resources being required to address this element.¹⁴⁶⁶ These commenters added that regulatory and surveillance requirements should be defined before adding Primary Market Transaction data to the CAT and disputed the Commission’s assessment in the Notice of the CAT NMS Plan that top-account allocation should be a CAT data element.¹⁴⁶⁷ One of these commenters noted that significant analysis and data modelling would be required to effectively and efficiently include Primary Market Transaction data.¹⁴⁶⁸ The other commenter cited a DAG recommendation that if Primary Market Transaction data were required that only sub-account allocation data should be included due to operational feasibility.¹⁴⁶⁹ The same commenter also requested clarification as to what is meant by Primary Market Transaction “allocations,” and described its understanding that “allocations” under Rule 613(a)(1)(vi) only apply to the final

¹⁴⁶⁴ See SIFMA Letter at 36; FIF Letter at 13, 118–20.

¹⁴⁶⁵ See Hanley Letter.

¹⁴⁶⁶ SIFMA Letter at 36; FIF Letter at 13 (noting that “the primary market and the secondary market are inherently different ... different rules and reporting requirements, ... business processes, ... vendors, ... and systems with different technology personnel.”).

¹⁴⁶⁷ SIFMA Letter at 36; FIF Letter at 13; see also Notice, supra note 5, at 30772 (“The Commission preliminarily believes that the potential benefits of including top-account information in the CAT could be significant and that the costs of including top-account information could be lower than what is described in the CAT NMS Plan and appropriate in light of significant potential benefits. For these reasons, the Commission preliminarily believes that top-account information should not be excluded from the Discussion Document.”).

¹⁴⁶⁸ FIF Letter at 13.

¹⁴⁶⁹ SIFMA Letter at 36.

step in the allocation process (i.e., not the preliminary book building allocations but the actual placement into a customer’s account).¹⁴⁷⁰

The third commenter, however, advocated for including Primary Market Transaction data (both top-account and sub-account) in the CAT.¹⁴⁷¹ The commenter believed that regulators would benefit from having both sub-account and top-account Primary Market Transaction data, noting that such data would help regulators understand the economics of the offering process and could promote efficient capital formation.¹⁴⁷² The commenter reviewed academic literature related to the book building allocation process and suggested that the collection and analysis of Primary Market Transaction data could address open questions as to potential capital formation inefficiencies, including potential manipulation and/or violations of Rule 105 and fund manipulation.¹⁴⁷³ The commenter stated that Form 13F data cannot fully capture primary market allocations because it is limited to institutional investment managers with investment discretion over \$100 million, and because secondary market transactions may occur before the filing of Form 13F is required.¹⁴⁷⁴ The commenter also recommended that the SROs and the Commission require indications of interest during preliminary book building to be made available in an easily accessible format for both regulators and academics outside of CAT.¹⁴⁷⁵

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Id.

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Hanley Letter.

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Id. at 1.

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Id. at 2–3.

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Id. at 1 (noting “[t]op-account allocations refer to allocations during the book-building process to institutional clients and retail broker-dealers ... the subsequent sub-account allocations to the actual accounts receiv[e] the shares”).

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Id. at 5–6. The commenter, however, stated that it is not requesting that CAT include pre-offer changes in tentative allocations. Hanley Letter at 4–6 (noting that during the

The commenter advocating for the inclusion of both top-account and sub-account allocation Primary Market Transaction data also cited and disputed a FIF estimate that it would cost broker-dealers approximately \$704,200 per firm to provide initial allocation information, stating that “manually entering top-account allocation information into CAT (if available) should cost substantially less than estimated.”¹⁴⁷⁶ The commenter estimated costs to be \$2,400 per offering for providing top-account allocation information, and argued such costs would be “de minimis with respect to the overall cost of issuance.”¹⁴⁷⁷ The commenter also contested FIF’s cost estimate of \$58.7 million for providing sub-account information, noting that if CAT were to replace EBS¹⁴⁷⁸ then the incremental cost of providing sub-account allocation information should also be de minimis.¹⁴⁷⁹

In response to commenters, the Participants maintained their support for including in the CAT sub-account allocations but did not support reporting, or discussing in the Discussion Document, top-account allocations.¹⁴⁸⁰ The Participants reiterated that top-account allocation reporting for Primary Market Transactions would “likely impose significant costs to CAT Reporters while only providing a marginal additional regulatory benefit over sub-account allocation data.”¹⁴⁸¹ The Participants further stated that they have not determined a timeline for

pre-offering stage of a book-building process, preliminary indications of interest while gathered are believed to be subject to change).

¹⁴⁷⁶ Id. at 4.

¹⁴⁷⁷ Id. at 5.

¹⁴⁷⁸ EBS are trading records requested by the Commission and SROs from broker-dealers that are used in regulatory investigations to identify buyers and sellers of specific securities.

¹⁴⁷⁹ Hanley Letter at 5.

¹⁴⁸⁰ Response Letter I at 49.

¹⁴⁸¹ Id.

reporting Primary Market Transaction allocations, but have committed to not require it during the initial implementation phase of CAT.¹⁴⁸²

Consistent with the reasoning stated in the adoption of Rule 613, the Commission believes that the Discussion Document should discuss the potential costs and benefits of expansion of CAT to include both top-account and sub-account allocations for Primary Market Transactions. At the same time, the Commission acknowledges that mandating the inclusion of Primary Market Transaction data, either top-account or sub-account, would require Commission action following public notice and comment. The Commission discusses the Primary Market Transaction cost comments in its economic analysis below.¹⁴⁸³

b. Futures

Rule 613 and the CAT NMS Plan do not require the reporting of audit trail data on the trading of futures. One commenter, noting that the CAT NMS Plan does not require any information about stock index futures or options on index futures, stated that incorporating futures data into CAT would “create a more comprehensive audit trail, which would further enhance the SROs’ and Commission’s surveillance programs.”¹⁴⁸⁴

As noted above, the Participants, within six months of the CAT NMS Plan’s approval by the Commission, will provide the Discussion Document that will include a discussion of how additional securities and transactions could be incorporated into CAT.¹⁴⁸⁵ In their response, the

¹⁴⁸² Id. at 50. In response to a commenter seeking clarification on the meaning of certain aspects of Primary Market Transactions, the Participants identified the relevant Plan provisions for the commenter. Id. at 50–51.

¹⁴⁸³ See Section V.H.8, infra.

¹⁴⁸⁴ CBOE Letter at 2; see also Better Markets Letter at 7.

¹⁴⁸⁵ See CAT NMS Plan, supra note 5, at Section 6.11.

Participants recognized that “the reporting of additional asset classes and types of transactions is important for cross-market surveillance.”¹⁴⁸⁶ Further, the Participants stated their belief that the Commission also recognizes “the importance of gradually expanding the scope of the CAT,” and cited the Adopting Release, wherein the Commission directed the Commission Staff “to work with the SROs, the CFTC staff, and other regulators and market participants to determine how other asset classes, such as futures, might be added to the consolidated audit trail.”¹⁴⁸⁷

Accordingly, the Participants stated that they intend to assess whether it would be appropriate to expand the scope of the CAT to include futures, at a later date.

The Commission believes that the omission of futures data from the CAT NMS Plan is reasonable, particularly in light of limitations on the Commission’s jurisdiction.

11. Error Rate

CAT Data reported to the Central Repository must be timely, accurate and complete.¹⁴⁸⁸ The CAT NMS Plan specifies the maximum Error Rate for CAT Reporters.¹⁴⁸⁹ As noted in Section III.19, the term Error Rate is defined as “the percentage of [R]eportable [E]vents collected by the [C]entral [R]epository in which the data reported does not fully and accurately reflect the order event that occurred in the market.”¹⁴⁹⁰ The Error Rate will apply to CAT Data

¹⁴⁸⁶ Response Letter I at 26. The CAT NMS Plan specifies that the Discussion Document will include a discussion of debt securities and Primary Market Transactions, but does not expressly require that futures be in the Discussion Document. See CAT NMS Plan, supra note 5, at Section 6.11.

¹⁴⁸⁷ Response Letter I at 26–27 (citing Adopting Release, supra note 14 at 45745 n.241).

¹⁴⁸⁸ See CAT NMS Plan, supra note 5, at Section 6.5(d)(2).

¹⁴⁸⁹ Id. at Section 6.5(d)(i). The Participants expect that post-correction Error Rates will be de minimis. See id. at Appendix C, Section A.3(b), n.102.

¹⁴⁹⁰ See id. at Section 1.1; see also 17 CFR 242.613(j)(6).

as it is initially submitted to the Central Repository, before it has undergone the correction process.¹⁴⁹¹

a. Definition of Error

Some commenters sought additional information about the meaning of the term “Error Rate” and how Error Rates would be calculated. One commenter suggested that there should be clarification as to whether all errors would be treated equally.¹⁴⁹² Another commenter questioned whether there would be a minimum number of reports submitted before Error Rate calculations would take place, and whether all data submissions would be covered.¹⁴⁹³ One commenter suggested that Error Rates be calculated daily on a rolling average, comparing a CAT Reporter’s error rate to an aggregate Error Rate, so as to take into account daily fluctuations in Error Rates.¹⁴⁹⁴ One commenter did not believe that all errors should be treated with the same severity, noting that some errors can be auto-corrected by CAT, and some errors (such as late reporting) can be immediately resolved, while other errors, such as linkage errors, are more problematic.¹⁴⁹⁵ Three commenters suggested that the Error Rate should apply only to post-

¹⁴⁹¹ See CAT NMS Plan, supra note 5, at Appendix C, Section A.3(a) (stating, “[T]he initial step in ensuring the reliability and accuracy of data in the Central Repository is the validation checks made by the Plan Processor when data is received and before it is accepted into the Central Repository.”)

¹⁴⁹² SIFMA Letter at 6.

¹⁴⁹³ UnaVista Letter at 4.

¹⁴⁹⁴ FIF Letter at 51.

¹⁴⁹⁵ Id. at 57. This commenter also stated that importance of data quality could consider whether the same data is available from multiple sources, noting that if two or more CAT Reporters are supplying the same information, regulators could effectively surveil if only one source of the data was correct. See id. at 58.

correction, not pre-correction, data.¹⁴⁹⁶ One of these commenters expressed support for the eventual goal of a de minimis post-correction Error Rate, but could not predict how long this would take to be achieved.¹⁴⁹⁷

The Participants responded by explaining that the CAT NMS Plan adopted the definition of Error Rate from Rule 613, which does not distinguish among order events and focuses on cases where data “does not fully and accurately reflect the order event that occurred in the market.”¹⁴⁹⁸ The Participants stated that they believe this definition is appropriate.¹⁴⁹⁹ The Participants disagreed with commenters who suggested that the maximum Error Rate should be based on post-correction data,¹⁵⁰⁰ and noted that a maximum Error Rate based on pre-corrected data is intended to encourage CAT Reporters to submit accurate data initially and to reduce the need for error corrections, as well as allow regulators more timely access to accurate data.¹⁵⁰¹

The Commission believes that the proposed, uniform definition of Error Rate is reasonable. The Commission also agrees with the Participants that Error Rates should be calculated based on pre-correction, and not post-correction, data. The Commission believes that assessing Error Rates on a pre-correction basis is important to ensure that CAT Reporters submit CAT Data in compliance with the Plan and applicable rules of the Participants, and develop and maintain their reporting systems in a way that minimizes errors. In addition, focusing on Error

¹⁴⁹⁶ FSR Letter at 9; SIFMA Letter at 7; FIF Letter at 51.

¹⁴⁹⁷ FIF Letter at 52, 60. The commenter also noted that currently OATS does not have a de minimis error rate, and questioned how the CAT Plan Processor could detect errors that OATS cannot correct. Id. at 60.

¹⁴⁹⁸ Response Letter I at 45 (citing 17 CFR 242.608(j)(6)).

¹⁴⁹⁹ Id.

¹⁵⁰⁰ FSR Letter at 9; SIFMA Letter at 7; FIF Letter at 51.

¹⁵⁰¹ Response Letter I at 47.

Rates for pre-corrected data should reduce reliance on the error correction process, and improve the accuracy of the “uncorrected” CAT Data available to regulators in circumstances where immediate action is required. The Commission also believes it critical that the error correction process be effective, so that errors in post-correction CAT Data will be de minimis, as contemplated by the Participants.

b. Maximum Error Rate

Several commenters expressed opinions regarding the initial maximum Error Rate. Two commenters supported a 5% initial maximum Error Rate.¹⁵⁰² One of these commenters believed that a 5% Error Rate would permit an appropriate level of flexibility for CAT Reporters while still ensuring that CAT Data would be useable for market reconstructions.¹⁵⁰³ Another commenter, however, disagreed and argued that, given the industry’s experience with OATS, the maximum Error Rates should be lower than those proposed by the Participants.¹⁵⁰⁴

Several commenters expressed views on how the initial maximum Error Rate should be adjusted over time.¹⁵⁰⁵ Two commenters supported the Plan’s requirement to evaluate Error Rates at least annually.¹⁵⁰⁶ One of these commenters also believed that lowering the maximum Error Rate to 1% after one year of reporting was acceptable based on the current OATS error

¹⁵⁰² UnaVista Letter at 3–4; FSR Letter at 9.

¹⁵⁰³ UnaVista Letter at 3.

¹⁵⁰⁴ Better Markets Letter at 9.

¹⁵⁰⁵ UnaVista Letter at 3–4, Better Markets Letter at 9, FIF Letter at 50–52, SIFMA Letter at 6; FSR Letter at 9; see also Section IV.D.9, supra, for a summary of comment letters that discuss how error rates impact the retirement of duplicative systems.

¹⁵⁰⁶ UnaVista Letter at 3–4; FSR Letter at 9.

rates and the commenter's own experience with regulatory reporting.¹⁵⁰⁷ Another commenter stated that it was difficult to assess whether a maximum Error Rate of 1% after one year of reporting was appropriate, and indicated that it would prefer a more gradual rate decrease.¹⁵⁰⁸ The commenter recommended that the Operating Committee establish maximum Error Rates for the second and third years of reporting after reviewing the first year's Error Rate data.¹⁵⁰⁹ Two commenters recommended that the maximum Error Rate be reviewed whenever there are significant changes to the CAT (e.g., the addition of security classes)¹⁵¹⁰ or applicable regulations.¹⁵¹¹

In response to concerns that the Participants do not have sufficient information or experience to determine the initial maximum Error Rate,¹⁵¹² the Participants explained that they established this maximum Error Rate after performing a detailed analysis of OATS error rates over time, and believed that such analysis provided a sound basis for their determination.¹⁵¹³ The Participants stressed the importance of evaluating a CAT Reporter's actual experience, in setting an appropriate maximum Error Rate, and noted that the CAT NMS Plan requires the

¹⁵⁰⁷ UnaVista Letter at 3–4.

¹⁵⁰⁸ FIF Letter at 56, 58.

¹⁵⁰⁹ Id. The commenter stated the objective should be an Error Rate that meets the regulators' surveillance objectives, and is achievable by CAT Reporters at a reasonable cost. Id. at 57.

¹⁵¹⁰ Id. at 52, 55.

¹⁵¹¹ UnaVista Letter at 4.

¹⁵¹² FIF Letter at 50, SIFMA Letter at 6–7.

¹⁵¹³ Response Letter I, at 45–46. This analysis considered the initial error rates for reporting by market participants that were reporting audit trail information to OATS for the first time, and assumed a similar learning curve would be experienced by CAT Reporters who have not previously reported audit trail information, such as options market participants.

Operating Committee to review the maximum Error Rate at least annually.¹⁵¹⁴

With respect to the comments recommending that the maximum Error Rate also be reviewed upon significant changes to the CAT or regulations, the Participants noted that the required testing and other management processes surrounding CAT systems changes should mitigate concerns about their impact on Error Rates, and that the periodic updates on Error Rates provided to the Operating Committee should alert them if there is a need to change the maximum Error Rate.¹⁵¹⁵

The Commission believes that the proposed 5% initial maximum Error Rate is reasonable and strikes an appropriate balance between: (1) ensuring that the initial submissions to the Central Repository by CAT Reporters are sufficiently accurate for regulatory use; and (2) providing CAT Reporters with time to adjust to the new more comprehensive regulatory reporting mechanism. The Commission understands that the Participants considered relevant historical information related to OATS reporting error rates, particularly when new reporting requirements were introduced, and believes this is a reasonable basis for setting the initial maximum Error Rates for CAT Data.¹⁵¹⁶ The Commission understands that CAT Reporters who currently report to OATS report with a significantly lower Error Rate, but recognizes that more flexibility may be necessary during the transition, and notes the 1% maximum Error Rate

¹⁵¹⁴ Id.

¹⁵¹⁵ Id. at 46–47.

¹⁵¹⁶ Participants have considered the industry’s experience with the OATS system over the last 10 years, including three significant additions to OATS: (1) requirement that manual orders be reported to OATS; (2) requirement that OTC Equity Securities be reported to OATS; and (3) requirement that all NMS stocks be reported to OATS. Each of these changes resulted in significant updates to the required formats which required OATS reporters to update and test their reporting systems and infrastructure. See CAT NMS Plan, supra note 5, at Appendix C, Section A.3(b).

applicable to each CAT Reporter one year after their reporting obligation has begun is comparable to current OATS reporting error rates.¹⁵¹⁷

The Commission also believes that the process established by the CAT NMS Plan for reducing the maximum Error Rate over time is reasonable, and emphasizes the important roles of both the Plan Processor and the Operating Committee in ensuring that Error Rates are steadily reduced over time. The Plan requires the Plan Processor regularly to provide information and recommendations regarding Error Rates to the Operating Committee,¹⁵¹⁸ and requires the Operating Committee to review and reset the maximum Error Rate at least on an annual basis.¹⁵¹⁹ Given the importance to regulators of audit trail information that meets high standards of accuracy, the Commission expects the Plan Processor and Participants to closely monitor Error Rates, particularly in the early stages of CAT implementation, so that steps can be taken to reduce the maximum Error Rate as promptly as possible. The Commission also encourages the Plan Processor and Participants to assess the impact of significant changes to the CAT or applicable regulations on the maximum Error Rate, at least on a transitional basis, and provide additional flexibility as warranted. As described in Section IV.H, the Commission is amending Section 6.6 of the Plan to require that, prior to the implementation of any Material Systems Change, the Participants provide the Commission with an assessment of the projected impact of any Material Systems Change on the maximum Error Rate.

c. Different Error Rates for Different Products and Data Elements

The CAT NMS Plan imposes the same Error Rate on all products and data elements.

¹⁵¹⁷ See id. at Appendix C, Section A.3(b), n.99.

¹⁵¹⁸ Id. at Appendix C, Section A.3(b).

¹⁵¹⁹ See id. at Section 6.5(d)(i); Appendix C, Section A.3(b).

Commenters suggested differentiation in this area. One commenter recommended that the Error Rate only apply to equities.¹⁵²⁰ Another commenter suggested that Error Rates for equities, options and customer data should be calculated separately.¹⁵²¹ A third commenter expressed the view that, as new products are covered by CAT, they should be subject to a more liberal Error Rate for an appropriate transition period.¹⁵²² Two commenters did not believe there is enough information to set an appropriate maximum Error Rate for options market making, customer information or allocations, given that there is little or no reporting history for them, and suggested applying the Error Rate on a post-correction basis for these products and data elements, at least for a transitional period.¹⁵²³

In response, the Participants stated that they continue to believe that a single overall Error Rate for all products and data elements is appropriate.¹⁵²⁴ They acknowledged the importance of gathering more granular information about Error Rates, including differences among products, and noted that the CAT NMS Plan requires the Plan Processor to provide the Operating Committee with regular reports that show more detailed Error Rate data.¹⁵²⁵

The Commission believes that it is reasonable, at this time, to apply the same maximum Error Rate to all products and data elements, in the Plan filed by the Participants. The Commission notes that the initial 5% maximum Error Rate, which substantially exceeds the OATS error rates, was established in recognition of the fact that certain products (e.g., options)

¹⁵²⁰ FSR Letter at 9.

¹⁵²¹ SIFMA Letter at 6.

¹⁵²² FIF Letter at 52.

¹⁵²³ FIF Letter at 51, SIFMA Letter at 6–7.

¹⁵²⁴ Response Letter I at 47.

¹⁵²⁵ Id. (referencing CAT NMS Plan Section 6.1(o)(v)).

and data elements (e.g., market maker quotes, customer information) had not previously been reported in OATS. The Commission, however, notes that the Participants may assess, as the CAT is developed and implemented, whether it is appropriate to impose Error Rates that vary depending on the product, data element, or other criteria.¹⁵²⁶ As discussed in Section IV.H, the Commission is amending the Plan to require that the Participants provide the Commission with an annual evaluation that addresses the application of Error Rates based on product, data elements or other criteria.

d. Compliance with Maximum Error Rate During the Initial Implementation Period

Two commenters suggested that CAT Reporters not be required to comply with the maximum Error Rate during the initial implementation period for the CAT.¹⁵²⁷ One of these commenters explained that this would provide CAT Reporters a window of time to better understand the types of errors that are being returned by the CAT, and adjust their processes accordingly, without incurring liability for exceeding the maximum Error Rate.¹⁵²⁸ Another commenter stressed the importance of receiving feedback from the Plan Processor so that CAT

¹⁵²⁶ Section 6.5(d) of the CAT NMS Plan contemplates a single Error Rate for all data. If the Participants determine that it is appropriate to establish different Error Rates for different products, data elements, or other criteria, a Plan amendment, subject to notice and comment, would be required.

¹⁵²⁷ SIFMA Letter at 6–7, UnaVista Letter at 4. One commenter also stated that small broker-dealers should not be excused from error rate requirements if they begin reporting voluntarily at the same time large broker-dealers begin reporting. This commenter argued that if small broker-dealers are permitted to report to CAT with limitless errors during the phase designed for large broker-dealers to report without being subject to an error rate, the utility of CAT will be diminished. See Better Markets Letter at 9. The Commission believes that a maximum Error Rate would apply to anyone reporting to CAT, whether mandated to do so to be in accordance with the CAT NMS Plan or voluntarily.

¹⁵²⁸ SIFMA Letter at 6.

Reporters can identify weaknesses and improve the accuracy of their CAT reporting.¹⁵²⁹ This commenter recommended that the Plan Processor provide CAT Reporters with a detailed daily error report, as well as monthly report cards.¹⁵³⁰

The Participants responded by noting that Rule 613(g) requires the Participants to enforce compliance by their members with the provisions of the Plan at all times it is in effect.¹⁵³¹ The Participants also pointed out that the Plan provides that CAT Reporters will be provided tools to facilitate testing and error correction, as well as have access to user support. With respect to the importance of feedback from the Plan Processor,¹⁵³² the Participants noted that the Plan requires the Plan Processor to provide CAT Reporters with error reports, including details on the reasons for rejection, as well as daily and monthly statistics from which CAT Reporters can compare their performance with their peers.¹⁵³³ As discussed in Section IV.H, the Commission is amending the Plan to require that the Participants provide the Commission with an annual evaluation of how the Plan Processor and the Participants are monitoring Error Rates.

The Commission believes that the implementation period for Error Rates is reasonable and that it is not necessary to establish a grace period, as suggested by commenters, during which Error Rates would not apply. Ensuring the accuracy of CAT Data is critical to regulators and, as noted above, the initial maximum Error Rates have been set at levels to accommodate the fact

¹⁵²⁹ FIF Letter at 52.

¹⁵³⁰ FIF Letter at 54; see also SIFMA Letter at 7. This commenter also recommended that the CAT include a robust toolset and customer service model to assist CAT Reporters in meeting the established error rates. See FIF Letter at 126–127.

¹⁵³¹ Response Letter I at 47–48.

¹⁵³² FIF Letter at 52, 55, 57.

¹⁵³³ See Response Letter I at 48 (referencing CAT NMS Plan, Appendix D, Section 1.2).

that CAT Reporters will be adjusting to a new regulatory reporting system.¹⁵³⁴ In addition, the Commission notes that the CAT NMS Plan provides for testing periods,¹⁵³⁵ as well as tools and other support, to facilitate initial compliance by CAT Reporters. As noted by the Participants, the Plan Processor will provide regular feedback to CAT Reporters with respect to their reporting weaknesses to assist them in reducing their Error Rates.¹⁵³⁶

e. Error Correction Timeline

The CAT NMS Plan sets forth a timeline with deadlines for providing raw data and corrected data to the CAT. CAT Reporters must submit data to the CAT by 8:00 a.m. ET on T+1.¹⁵³⁷ By 12:00 p.m. ET on T+1, the CAT must perform checks for initial validations and lifecycle linkages, and communicate errors to CAT Reporters.¹⁵³⁸ CAT Reporters must resubmit corrected data to the CAT by 8:00 a.m. ET on T+3.¹⁵³⁹ The Plan Processor must ensure that regulators have access to corrected and linked order and Customer data by 8:00 a.m. ET on T+5.¹⁵⁴⁰

¹⁵³⁴ In response to the commenter that noted that if two or more CAT Reporters are supplying the same information, regulators could effectively surveil if only one source of the data was correct, see FIF Letter at 58, the Commission believes that it is important that the audit trail contains consistently accurate information from all sources obligated to report data and that errors not be permitted to exist in the audit trail just because they were correctly reported by one party.

¹⁵³⁵ See Section IV.D.8, supra, for a description of testing periods.

¹⁵³⁶ The Plan requires the Plan Processor to define and design a process to efficiently and effectively communicate with CAT Reporters to identify errors, so that they can work to ensure that they get feedback to improve their reporting. See CAT NMS Plan, supra note 5, at Appendix C, Section A(3)(b).

¹⁵³⁷ See id. at Sections 6.3(b)(ii), 6.4(b)(ii).

¹⁵³⁸ Id. at Appendix C, Section A.1(a)(iv).

¹⁵³⁹ Id.

¹⁵⁴⁰ Id. at Appendix C, Section A.2(a).

Two commenters believed the error correction timeline was too aggressive, and that at least initially, the CAT should use the current error correction timelines for systems such as OATS, which is T+5.¹⁵⁴¹ One commenter specifically suggested that the timeline for error corrections should remain at T+5 for the first year of CAT reporting.¹⁵⁴² This commenter also noted that, because the Plan Processor is required to communicate errors to CAT Reporters by 5:00 p.m. ET on T+1, staffing adjustments may be necessary to ensure that the appropriate personnel are available after 5:00 p.m. ET to analyze and correct data, and if communications with a customer were necessary to correct an error, the CAT Reporter could not satisfy the 8:00 a.m. ET T+2 timeline for providing corrected data.¹⁵⁴³ This commenter also recommended that the Plan Processor identify errors in customer information data by noon on T+1, the same time as the Plan Processor identifies errors in transaction reports, instead of by 5:00 p.m. ET on T+1, to assist with prompt analysis of linking errors.¹⁵⁴⁴ Another commenter suggested that the use of

¹⁵⁴¹ KCG Letter at 9; FIF Letter at 52.

¹⁵⁴² FIF Letter at 52. The commenter also noted that CAT Reporters do not have access to their reported data using a bulk extract format, which would facilitate error validation and correction. Id. The commenter also suggested that the five-day error correction timeline begin from the time the CAT Reporter receives a reject message. Id. at 53.

¹⁵⁴³ Id. at 53. The Commission notes that time by which a CAT Reporter must report corrected Customer data is 5:00 p.m. ET on T+3.

¹⁵⁴⁴ Id. This commenter also suggested that CAT provide an “incident” error functionality, similar to the one available for OATS. This functionality would allow CAT Reporters that are experiencing a systematic issue with reporting to submit an incident report to CAT and receive a case number, so the CAT Reporter’s data reported could be tracked and referenced when considering the Reporter’s error rate compliance. See FIF Letter at 130.

“pre-validation checks,” prior to the formal submission of data to the CAT, could enhance the accuracy and integrity of the CAT Data.¹⁵⁴⁵

In response to commenters who believed the timeframe for correction of CAT Data was too short, the Participants stressed the importance to regulators of the prompt availability of accurate data.¹⁵⁴⁶ The Participants stated that the three day window for correction provided in the CAT NMS Plan appropriately balances the need for regulators to have prompt access to accurate data with the burdens imposed on the industry by the shorter error correction timeframe.¹⁵⁴⁷ The Participants noted that the shorter three-day error correction timeframe would allow better regulatory surveillance and market oversight in accordance with Rule 613.¹⁵⁴⁸ In response to the commenter that requested additional time to correct errors in customer data, the Participants expressed the view that the two-day timeframe provided by the Plan is sufficient to accommodate any communications with customers that might be necessary to correct errors in customer data.¹⁵⁴⁹ With respect to the suggestion to use pre-validation checks, the Participants acknowledged their value, and stated that they have discussed with the Bidders making tools, such as pre-validation checks, available to CAT Reporters to assist with data submission.¹⁵⁵⁰

The Commission believes that the error correction timeline set forth in the CAT NMS Plan is reasonable. Improved accuracy and timeliness of regulatory data are key goals of Rule

¹⁵⁴⁵ UnaVista Letter at 4. The commenter also noted that a T+5 timeframe for regulatory access is feasible but that uniform formatting or pre-validation checks may reduce the timeframe for regulatory access. Id.

¹⁵⁴⁶ Response Letter I at 30.

¹⁵⁴⁷ Id.

¹⁵⁴⁸ Id.

¹⁵⁴⁹ Id.

¹⁵⁵⁰ Id.

613 and the CAT NMS Plan.¹⁵⁵¹ In response to commenters that suggested that the error correction timeline is too aggressive, the Commission believes that the error correction tools and processes to be established by the Plan Processor, and the accommodations to facilitate the use of existing systems by CAT Reporters, should ease the burden of complying with shorter error correction timelines than exist today in OATS.¹⁵⁵² The Commission believes any incremental compliance burden in this area is offset by the benefits of faster availability to regulators of corrected CAT Data for important regulatory purposes, such as surveillance, oversight and enforcement, as well as market reconstructions, in today's high-speed electronic markets.

In response to the commenter that stated that additional staffing may be needed to assist in addressing error correction information that is received from the Plan Processor at 5:00 p.m. ET on T+1, the Commission believes, as noted above, the regulatory benefits of a shorter error correction timeframe justify the incremental compliance costs, including the potential hiring of additional staff in some cases.¹⁵⁵³ The Commission also believes that CAT Reporters would have sufficient time to contact customers in the event customer feedback was necessary to correct errors.¹⁵⁵⁴ In this regard, the Commission notes that the CAT NMS Plan provides that

¹⁵⁵¹ See Adopting Release, supra note 13, at 45727.

¹⁵⁵² The timeline in the CAT NMS Plan improves the timeliness of regulators' access to data they use for much of their surveillance by several days because the corrected and linked CAT Data would be accessible on T+5, compared to OATS Data, which is not available until T+8.

¹⁵⁵³ See Section V.F.3.a(7), infra.

¹⁵⁵⁴ FIF Letter at 53.

corrected order data is not required to be reported until 8:00 a.m. ET on T+3, and corrected Customer data is not required to be reported until 5:00 p.m. ET on T+3.¹⁵⁵⁵

12. Business Continuity and Disaster Recovery

The CAT NMS Plan requires the Plan Processor to implement efficient and cost-effective business continuity and disaster recovery capabilities that will ensure no loss of data and will support the data availability requirements and anticipated volumes of the Central Repository.¹⁵⁵⁶

Commenters discussed the CAT NMS Plan's provisions regarding business continuity and disaster recovery for the CAT.¹⁵⁵⁷ One commenter noted that the Plan does not include an explanation of how the primary and the secondary sites will remain synchronized at all times to provide a seamless transition from primary site to secondary site in the event of a failure.¹⁵⁵⁸

This commenter suggested that the Plan should specify additional details regarding the expected

¹⁵⁵⁵ In Response Letter I, the Participants noted an inadvertent error in Appendix D relating to the Error Rate correction time. Specifically, the Plan incorrectly states that the Plan Processor must validate customer data and generate error reports no later than 5:00 p.m. ET on T+3. The Plan should state that such validations and error reports must occur no later than 5:00 p.m. ET on T+1. The Commission is amending the Plan to correct this error.

¹⁵⁵⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section A.3(f); Appendix D, Sections 5.1–5.4.

¹⁵⁵⁷ SIFMA Letter; Data Boiler Letter (also noting that, if the markets deem acceptable that exchanges experience downtime without going into a contingency mode or halting trading, then standards comparable to those required of exchanges, but not tighter, are sufficient, due to cost); FSI Letter; FIF Letter. One commenter requested clarification of the requirement for a bi-annual test of the CAT systems at the disaster recovery site. This commenter noted that “bi-annual” is commonly understood to mean twice a year, but can also mean once every two years. The commenter believed that clarification is necessary to ensure that the site is tested twice a year. It also believed that secondary equipment and critical personnel should be tested at least once a year. See FSI Letter at 5. In their response, the Participants affirmed that the bi-annual disaster recovery test of CAT operations at the secondary facility is required to be conducted twice a year. See Response Letter I at 51.

¹⁵⁵⁸ SIFMA Letter at 45.

elapsed time for the secondary site to become live if the primary site goes down due to a technical failure or a disaster.¹⁵⁵⁹ The commenter also noted that the requirement for disaster recovery plans does not address whether regulators will have uninterrupted access to the CAT Data, although the commenter acknowledged that it can be inferred that the secondary site should provide all the functionalities of the primary site in the event of primary site outage.¹⁵⁶⁰ Further, the commenter recommended that while the CAT NMS Plan states that the goal of disaster recovery is to achieve next day recovery after an event, the Plan should provide a list of scenarios and the expectation of the recovery times for each scenario.¹⁵⁶¹

One commenter recommended that the CAT NMS Plan state that the Plan Processor must support 24x7 production and test environments, provide test and validation tools to result in a higher quality audit trail, provide a consistent and comprehensive data security program, and provide an adequate level of help desk staffing, especially during industry testing and when Industry Members are being on-boarded.¹⁵⁶² This commenter also stated that large firms that already have the staffing capability for a 24x7 operating schedule could benefit from 24x7 production support, explaining that it would permit added flexibility in error processing or recovery scenarios, as well as the use of off-shore staffing.¹⁵⁶³ Another commenter

1559

Id.

1560

Id.

1561

Id.

1562

FIF Letter at 13, 49, 125–26.

1563

Id. at 123.

recommended that the CAT NMS Plan should not mandate a particular industry testing process, stating that “appropriate management flexibilities/discretions are needed.”¹⁵⁶⁴

The Participants argued that the Plan provisions with respect to business continuity and disaster recovery are appropriate, but did note that they intend to discuss with the Bidders requiring test environments to be available 24x7 instead of 24x6.¹⁵⁶⁵

The Commission has considered the business continuity and disaster recovery requirements set forth in the CAT NMS Plan, as well as the comments received addressing these requirements and believes that the Participants’ approach is reasonable. The Commission believes that the CAT NMS Plan’s business continuity and disaster recovery provisions establish a framework that is reasonably designed to ensure that the CAT business processes can continue despite a failure or disaster scenario.¹⁵⁶⁶ In particular, the CAT will be subject to all applicable requirements of Regulation SCI, as it will be an “SCI system”¹⁵⁶⁷ of each of the Participants, and the Participants, as “SCI entities”,¹⁵⁶⁸ are required to establish, maintain and enforce written policies and procedures for their SCI systems that comply with the technology standards and other requirements of Regulation SCI, including with respect to the business continuity and disaster recovery plans for the CAT.¹⁵⁶⁹ In addition, the CAT will be subject to certain

¹⁵⁶⁴ Data Boiler Letter at 42.

¹⁵⁶⁵ See Response Letter I at 51.

¹⁵⁶⁶ See CAT NMS Plan, supra note 5, at Appendix D, Section 5.4.

¹⁵⁶⁷ See supra note 1173.

¹⁵⁶⁸ See supra note 1172.

¹⁵⁶⁹ 17 CFR 242.1001(a)(2). See Section IV.D.6.f, supra, for a discussion of Regulation SCI.

additional requirements with respect to business continuity and disaster recovery that are set forth in the CAT NMS Plan.¹⁵⁷⁰

With respect to the commenter that noted that the Plan does not explain how the primary and the secondary sites will remain synchronized,¹⁵⁷¹ and that additional detail should be provided regarding the failover times between primary and secondary sites,¹⁵⁷² the CAT NMS Plan expressly requires recovery and restoration of services within 48 hours, but with a goal of next-day recovery. While data will not be synchronized in real time, sufficient synchronization will be maintained to support these recovery timeframes. Although, as noted above, the Commission believes the Participants' approach is reasonable, the Commission encourages the Plan Processor and Participants to strive to reduce the time it will take to restore and recover CAT Data at a backup site. As discussed in Section IV.H., the Commission is amending the Plan to require the Participants to submit to the Commission an annual evaluation of the time necessary to restore and recover CAT Data at a back-up site.

With respect to the commenter that recommended that the Plan Processor support 24x7 testing and production environments,¹⁵⁷³ the Commission recognizes that this could facilitate

¹⁵⁷⁰ For example, Appendix D requires a bi-annual test of CAT operations from the secondary site; an effective telecommuting solution for all critical CAT operations staff; and a secondary site with the same level of availability, capacity, throughput and security (physical and logical) as the primary site. See CAT NMS Plan, supra note 5, at Sections 5.3 and 5.4.

¹⁵⁷¹ SIFMA Letter at 45.

¹⁵⁷² Id.

¹⁵⁷³ FIF Letter at 13, 49. In response to the commenter's suggestions that the Plan Processor provide a consistent and comprehensive data security program, and an adequate level of help desk staffing, especially during industry testing and on-boarding, the Commission notes that the Plan Processor will support industry testing and provide help desk support during industry testing, and that the same information security policies applicable to the

disaster recovery and other important processes by Industry Members, and believes that the Participants' commitment to discuss requiring test environments to be available 24x7 with the Bidders is reasonable.¹⁵⁷⁴

13. Business Clock Synchronization and Timestamp Granularity

a. Business Clock Synchronization

(1) Industry Standard

Rules 613(d)(1) and (2) require CAT Reporters to synchronize their Business Clocks¹⁵⁷⁵ to the time maintained by NIST, consistent with industry standards. In the CAT NMS Plan, the Participants determined that the industry standard for the synchronization of Business Clocks is within 50 milliseconds of the time maintained by NIST, except for Manual Order Events.¹⁵⁷⁶ For Business Clocks used solely for Manual Order Events, the Participants determined that the industry standard for clock synchronization is within one second of NIST. To ensure that clock synchronization standards remain consistent with industry standards, as they evolve, the CAT NMS Plan requires the Operating Committee to annually review the clock synchronization standard to determine whether it should be shortened.

production environment will apply to the industry test environment. See CAT NMS Plan, supra note 5, at Appendix D, Section 1.2.

¹⁵⁷⁴ Response Letter I at 51.

¹⁵⁷⁵ For purposes of the CAT NMS Plan, "Business Clock" means a clock used to record the date and time of any Reportable Event required to be reported under SEC Rule 613. See CAT NMS Plan, supra note 5, at Section 1.1.

¹⁵⁷⁶ See Exemption Order, supra note 21. In this Order, the Commission is also amending the Plan to allow Business Clocks used solely for the time of an allocation to synchronize to within one second of NIST. See Section IV.D.4.d, supra.

In determining the current industry standard for clock synchronization, the Participants and Industry Members reviewed their respective clock synchronization technology practices,¹⁵⁷⁷ and the results of a clock synchronization survey conducted by FIF.¹⁵⁷⁸ After completing these reviews, the Participants concluded that a 50 millisecond clock synchronization standard represented an aggressive, but achievable, standard.¹⁵⁷⁹

The Commission received a number of comments on the CAT NMS Plan's provisions relating to clock synchronization. Several commenters agreed with the Participants that 50 milliseconds was a reasonable standard.¹⁵⁸⁰ Four commenters specifically recommended that the clock synchronization standard for OATS—also 50 milliseconds—and CAT should be aligned for regulatory reporting purposes.¹⁵⁸¹ One commenter argued for a finer standard for Industry Members, noting that they accept data feeds from exchanges that have more precise clock synchronization, some to the microsecond.¹⁵⁸²

Other commenters opposed mandating a standard finer than the 50 millisecond clock synchronization standard.¹⁵⁸³ One commenter argued that a finer synchronization standard could

¹⁵⁷⁷ CAT NMS Plan, supra note 5, at Appendix C, Section D.12(p).

¹⁵⁷⁸ Id. at Appendix C, n.236. See FIF Clock Offset Survey, supra note 247.

¹⁵⁷⁹ Id. at Appendix C, Section D.12(p).

¹⁵⁸⁰ SIFMA Letter at 34–35; FIF Letter at 110–111, 115; TR Letter at 7; Data Boiler Letter at 9, 20; FSR Letter at 8–9. Three of these commenters stated that there should be a uniform clock synchronization standard for Industry Members. SIFMA Letter at 34; FIF Letter at 97–98; FSR Letter at 8.

¹⁵⁸¹ Data Boiler Letter at 9 (noting that FINRA's current clock synchronization for Industry Members is 50 milliseconds); TR Letter at 7; SIFMA Letter at 34; FSR Letter at 8.

¹⁵⁸² Better Markets Letter at 8. The commenter recommended that exchanges and Industry Members should be required to use the same—presumably finer—clock synchronization standard for CAT purposes as they use for internal or commercial purposes.

¹⁵⁸³ FIF Letter at 102, TR Letter at 7.

not be met without dramatically increasing costs,¹⁵⁸⁴ and expressed the view that the 50 millisecond standard is reasonable given the geographically dispersed market.¹⁵⁸⁵ In particular, this commenter believed that, while a finer standard may create the illusion of a more accurate time sequence of events, in practice geographically dispersed market events could still be sequenced incorrectly.¹⁵⁸⁶ This commenter stated that it is better to allow for clock synchronization standards to be tightened voluntarily, based on business needs rather than regulatory requirements.¹⁵⁸⁷ Finally, one commenter expressed the view that clock synchronization was less important for certain types of orders, and suggested that the clock synchronization standard for manual orders, orders that have both a manual and electronic component, and orders that are not time-critical (e.g., post-trade events such as allocations) should be one second rather than 50 milliseconds.¹⁵⁸⁸

¹⁵⁸⁴ FIF Letter at 110. This commenter revisited the cost estimates for clock synchronization presented in the commenter’s Clock Offset Survey, noting in particular that the industry will face increased costs with a finer clock synchronization standard as industry has already been working toward a clock synchronization standard of 50 milliseconds, and would need another two years of lead time to comply with a finer standard than 50 milliseconds. FIF Letter at 108, 114; see also SIFMA Letter at 34.

¹⁵⁸⁵ FIF Letter at 99, 110–111. FIF recommended a pilot study be conducted to test the boundaries of clock synchronization and its accuracies across a broad geographic region at different tolerances for the purpose of event sequencing. Id. at 100, 112.

¹⁵⁸⁶ Id. at 102. FIF also noted that timestamps together with the daisy chain approach to linking orders and events will allow sequencing of events. Id. at 101.

¹⁵⁸⁷ Id. at 104–05. This commenter also argued that Industry Member CAT Reporters that synchronize their clocks to a finer standard voluntarily should not be required to maintain that clock synchronization under CAT as it would create an uneven playing field. Id. at 99, 112, 115. Similarly, another commenter noted that finer standards are already in place at exchanges and ATSS that maintain an order book and since they are already in place for commercial reasons, there is no reason to mandate them. TR Letter at 7.

¹⁵⁸⁸ SIFMA Letter at 34–35.

One commenter noted that stricter clock synchronization standards are already in place at exchanges and ATSS.¹⁵⁸⁹ Another commenter stated that, if exchanges maintained finer clock synchronization standards than currently required by the CAT NMS Plan, the ability to sequence Reportable Events that occur across markets could be improved.¹⁵⁹⁰

In their response, the Participants stated that they continue to believe that the clock synchronization standard for Industry Members should be within 50 milliseconds of the time maintained by NIST, except for with regard to Manual Order Events.¹⁵⁹¹ The Participants noted that they discussed this topic with Industry Members and conducted a survey of Industry Members to better understand current clock synchronization practices.¹⁵⁹² The Participants represented that they considered various clock synchronization options, which ranged from microseconds to one second, before settling on a 50 millisecond standard, which they believe represents the current industry standard for Industry Members.¹⁵⁹³ The Participants stated that, based on their analysis, imposing a finer clock synchronization standard for Industry Members as part of the initial implementation of the CAT would significantly increase the cost of compliance

¹⁵⁸⁹ TR Letter at 7.

¹⁵⁹⁰ FIF Letter at 97.

¹⁵⁹¹ Response Letter II at 4.

¹⁵⁹² Id.

¹⁵⁹³ Id. In response to the commenters that suggested that the CAT clock synchronization should be same as the OATS standard, the Participants agreed that there is value in consistency between these standards. See Response Letter I at 20. See also Securities Exchange Act Release No. 77565 (April 8, 2016), 72 FR 22136 (April 14, 2016) (approving a 50 millisecond clock synchronization requirement for FINRA members).

for some segments of the industry,¹⁵⁹⁴ but emphasized that the Operating Committee will be reviewing the synchronization standard annually and will reduce the standard as appropriate.¹⁵⁹⁵

The Participants, however, represented that they all currently operate pursuant to a clock synchronization standard that is within 100 microseconds of the time maintained by NIST, at least with respect to their electronic systems. Accordingly, the Participants recommended that the Commission amend the Plan to require that Participants adhere to the 100 microsecond standard of clock synchronization with regard to their electronic systems, but not their manual systems, such as the manual systems operated on the trading floor, manual order entry devices, and certain other systems.¹⁵⁹⁶

After reviewing the CAT NMS Plan, and considering the commenters' statements and the Participants' response thereto, the Commission believes that it is appropriate for the Participants to consider the type of CAT Reporter (e.g., Participant, Industry Member), the type of Industry Member (e.g., ATS, small broker-dealer), and type of system (e.g., order handling, post-execution) when establishing appropriate industry standards. The Commission does not believe that one industry standard should apply across all CAT Reporters and systems. Therefore, the

¹⁵⁹⁴ Response Letter II at 4 (noting CAT NMS Plan Appendix C, Section D.12(p)).

¹⁵⁹⁵ Response Letter II at 4 (noting CAT NMS Plan Section 6.8(c)).

¹⁵⁹⁶ Response Letter II at 4–5. In response to the commenters that argued that CAT Reporters would need lead time to address any changes made to the clock synchronization in the future, the Participants explained that Section 6.8(c) of the CAT NMS Plan requires that, in conjunction with Participants' and other appropriate Industry Member advisory groups, the CCO must annually evaluate and recommend to the Operating Committee whether technology has evolved such that the standard should be shortened. The Participants further explained they will take the time required for CAT Reporters to update and test their systems for any changes to the clock synchronization standard into consideration when determining when changes to the standard are necessary. Response Letter I at 21.

Commission is amending Section 6.8(c) of the Plan to state that industry standards for purposes of clock synchronization should be determined based on the type of CAT Reporter, type of Industry Member and type of system.

For the initial implementation of the CAT, however, the Commission believes a 50 millisecond clock synchronization standard for Industry Members is reasonable at this time. While the Commission believes that regulators' ability to sequence orders accurately in certain cases could improve if the clock synchronization for Industry Members were finer, the Commission is sensitive to the costs associated with requiring a finer clock synchronization for Industry Members at this time, and believes that a standard of 50 milliseconds for Industry Members will allow regulators to sequence orders and events with a level of accuracy that is acceptable for the initial phases of CAT reporting.

Although the Commission understands that certain Industry Members, such as ATSS and broker-dealers that internalize off-exchange order flow, today adhere to a finer clock synchronization standard, the Commission is not imposing a finer standard than 50 milliseconds for such Industry Members at this time. The Commission believes that it is reasonable to expect that finer clock synchronization for Industry Members, or certain categories or systems thereof, will evolve over time. As described in Section IV.H, the Commission is amending the Plan to require that the Participants provide the Commission an assessment of clock synchronization standards, including consideration of industry standards based on the type of Industry Member or type of system, within six (6) months of effectiveness of the Plan.

With regard to the Participants, however, the Commission notes that the Participants have acknowledged that they currently synchronize their Business Clocks to within 100 microseconds of NIST, and recommended that the Commission amend the Plan to require the Participants to

adhere to that finer standard for their non-manual systems.¹⁵⁹⁷ Accordingly, the Commission is amending Section 6.8(a)(i) of the Plan, consistent with this recommendation, to impose a clock synchronization standard of 100 microseconds on exchanges' electronic systems. The Commission believes that because the Participants already synchronize their clocks to this standard,¹⁵⁹⁸ any costs to comply with this standard are not likely to be substantial.¹⁵⁹⁹ In addition, the Commission believes that a finer clock synchronization requirement for exchanges generally should allow regulators to better sequence orders and order events across multiple exchanges.¹⁶⁰⁰ The Commission agrees with the Participants that it would not be appropriate to impose this finer standard with regard to Participants' manual systems, given that the timing of manual events is inherently less precise and the timestamp requirement for manual events is only to the second.¹⁶⁰¹ Accordingly, the Commission believes the one-second clock synchronization standard set forth in the Plan with respect to Manual Order Events, whether generated by the Participants or Industry Members, is reasonable.

The Commission believes the requirement that the Participants annually review the clock synchronization standard to determine whether it should be shortened, in light of the evolution of

¹⁵⁹⁷ Response Letter II at 4–5. In the Notice, the Commission explained that, according to FIF, all exchange matching engines meet a clock synchronization standard of 50 milliseconds, and NASDAQ stated that all exchanges that trade NASDAQ securities have clock offset tolerances of 100 microseconds or less. See Notice, supra note 5, at 30760.

¹⁵⁹⁸ Response Letter II at 4–5.

¹⁵⁹⁹ See Section V.F.3.a(5), infra.

¹⁶⁰⁰ See Section V.E.1.b(3)B, infra. A commenter agreed, noting that if exchanges were required to maintain finer clock synchronization standards than what the CAT NMS Plan currently requires, sequencing of the events in the lifecycle of an order across firms could be improved. FIF Letter at 97.

¹⁶⁰¹ See Section IV.D.13.b(1), infra.

technology, is reasonable to ensure that clock synchronization standards remain as tight as practicable in light of technological developments. In particular, as technology advances over time, the Commission believes that it will be appropriate for the Participants to consider whether some CAT Reporters should be required to maintain a finer clock synchronization than required by the Plan today. As the Participants conduct their annual reviews, the Commission expects them to consider proposing new clock synchronization standards whenever they determine the industry standard for CAT Reporters, or certain categories or systems thereof, has become more granular than required by the Plan at that time.¹⁶⁰² As discussed in Section IV.H., the Commission is amending Section 6.6 of the Plan to require that the Participants provide the Commission with a copy of the annual assessment performed by the Plan Processor pursuant to Section 6.8(c) of the Plan.

Compliance with the clock synchronization standards is vital to the accuracy of the CAT. To this end, the Operating Committee is required to adopt policies and procedures, including standards, that require that the CAT Data reported be timely, accurate, and complete, and to ensure the integrity of CAT Data.¹⁶⁰³ The Plan Processor is responsible for implementing these policies and procedures,¹⁶⁰⁴ and the CCO is tasked with regularly monitoring them.¹⁶⁰⁵ The

¹⁶⁰² The Participants should consider the amount of time the industry may need to implement and test a newly imposed clock synchronization standard, and notes that any change to the clock synchronization standard will need to be submitted to the Commission as a proposed amendment to the Plan pursuant to Rule 608. 17 CFR 242.608(a)(ii)(A) and (B), (b)(1). Therefore, the Commission, as well as commenters, will have an opportunity to assess any proposed change to the clock synchronization requirements, including the related implementation time frames.

¹⁶⁰³ See CAT NMS Plan, supra note 5, at Section 6.5(d)(ii).

¹⁶⁰⁴ Id.

¹⁶⁰⁵ Id. at Section 6.2(a)(v)(k).

Participants represented that they are developing their clock synchronization compliance rules, and will keep the industry informed as their efforts progress.¹⁶⁰⁶

(2) Documentation Requirements

The CAT NMS Plan also requires CAT Reporters to document their clock synchronization procedures, and maintain a log of each time they synchronize their clocks and the results of such synchronization. This log must specifically identify each synchronization event and note whenever the time of the CAT Reporter's Business Clock and the time maintained by the NIST differs by more than the permitted amount.¹⁶⁰⁷

One commenter objected to the requirement that each instance of clock synchronization be logged, and took the position that doing so would be costly.¹⁶⁰⁸ This commenter instead suggested that CAT Reporters should only be required to log instances of clock synchronization exceptions, and not all clock synchronization events.¹⁶⁰⁹ In response, the Participants reaffirmed that the Plan requires each Participant and Industry Member to maintain a log of all instances of clock synchronization.¹⁶¹⁰

¹⁶⁰⁶ Response Letter I at 20–21.

¹⁶⁰⁷ See CAT NMS Plan, supra note 5, at Appendix C, Section A.3.(c).

¹⁶⁰⁸ FIF Letter at 108.

¹⁶⁰⁹ Id. This commenter also recommended that reasonable policies and procedures be in place to ensure compliance with the clock synchronization requirements. See id. at 104–05. As noted above, the Plan requires that the Operating Committee adopt policies and procedures, including standards, that require that the CAT Data reported be timely, accurate, and complete, and to ensure the integrity of CAT Data.

¹⁶¹⁰ Response Letter I at 20.

The Commission acknowledges that there could be cost savings if the Plan did not require CAT Reporters to log every clock synchronization event,¹⁶¹¹ but it believes that having this information at the outset of the operation of the CAT should facilitate compliance with, and oversight of, the clock synchronization standards. To the extent the Participants find that a complete log of clock synchronization events is not required to effectively surveil for compliance with these standards, they may at a later date seek to amend the Plan to reduce the logging obligation as appropriate.

b. Timestamp Granularity

The CAT NMS Plan reflects the requirements in Rule 613 regarding timestamps, as modified by an exemption for Manual Order Events granted by the Commission.¹⁶¹² Specifically, the Plan requires CAT Reporters to record and report the time of each Reportable Event using timestamps reflecting current industry standards (which must be at least to the millisecond) or, if a CAT Reporter uses timestamps in increments finer than milliseconds, such finer increments, when reporting to the Central Repository. For Manual Order Events, the Plan provides that such events must be recorded in increments up to and including one second, provided that CAT Reporters record and report the time the event is captured electronically in an order handling and execution system (“Electronic Capture Time”) in milliseconds (“Manual Order Event Approach”).¹⁶¹³ Under the CAT NMS Plan, the CCO, in conjunction with the

¹⁶¹¹ See Section V.H.5, supra.

¹⁶¹² See Exemption Order, supra note 21, at 51. For purposes of the CAT NMS Plan, “Manual Order Event” is defined as a non-electronic communication of order-related information for which CAT Reporters must record and report the time of the event.

¹⁶¹³ See CAT NMS Plan, supra note 5, at Section 6.8(b); see also Exemption Order, supra note 21. In this Order, the Commission is amending the Plan to allow the time of an

Participants and Industry Member advisory groups, must annually review the timestamp granularity requirements of the CAT and determine whether to require finer timestamp granularity in light of the evolution of industry standards.¹⁶¹⁴

(1) Manual Order Event Approach

According to the Participants, the Manual Order Event Approach would not have an adverse effect on the various ways in which, and purposes for which, regulators would use, access, and analyze the CAT Data.¹⁶¹⁵ In particular, the Participants stated that they do not believe that the Manual Order Event Approach will compromise the linking of order events, or alter the time and method by which regulators may access the data.¹⁶¹⁶ The Participants also stated that the Manual Order Event Approach would not negatively impact the reliability and accuracy of the CAT Data.¹⁶¹⁷ Further, the Participants represented that one second is the industry standard for reporting the time of Manual Order Events.¹⁶¹⁸ The Participants conducted a cost-benefit analysis of the Manual Order Event Approach and concluded that this approach would impose a much smaller cost burden, if any, on market participants, than would transitioning to technology that has the capability to record timestamps for Manual Order Events to the millisecond.¹⁶¹⁹

allocation reported on an Allocation Report to be timestamped to the second. See Section IV.D.4.d, supra.

¹⁶¹⁴ See CAT NMS Plan, supra note 5, at Section 6.8(c).

¹⁶¹⁵ See Exemption Request, supra note 21, at 36.

¹⁶¹⁶ See id. at 36.

¹⁶¹⁷ See id. at 35.

¹⁶¹⁸ See id. at 32.

¹⁶¹⁹ See id. at 36–37.

Two commenters supported the CAT NMS Plan’s requirement that Manual Order Events be recorded and reported with a timestamp granularity of up to and including one second.¹⁶²⁰ One commenter stated that the requirement to record timestamps at one-second levels for manual orders was appropriate, and that it was not logical to require a finer timestamp given that attempting to record Manual Order Events at subsecond increments would be inherently imprecise.¹⁶²¹ Another commenter stated that a manual order timestamped to the second coupled with a daisy chain of other order events timestamped to the millisecond should create “a fairly clear sequence of events with the order lifecycle for the regulator.”¹⁶²²

One commenter expressed the view that there would be cost savings if a less stringent timestamp requirement for manual orders was imposed.¹⁶²³ Another commenter suggested using a more relaxed timestamp initially for manual orders, and to consider tightening the standard in the future.¹⁶²⁴ Another commenter suggested that anti-gaming provisions should be developed to ensure that CAT Reporters do not program their systems to generate orders that imitate manual orders to take advantage of the one second timestamp requirement.¹⁶²⁵

¹⁶²⁰ DAG Letter at 2; see also STA Letter at 1 (supporting the DAG Letter’s Exemptive Request Letter recommendations). These commenters also supported a clock synchronization standard of one second for Manual Order Events. See Section IV.D.13, supra.

¹⁶²¹ SIFMA Letter at 35.

¹⁶²² FIF Letter at 80. The commenter supported use of a daisy chain approach for linking orders, noting that it is successfully used by OATS and its logic is well-known by the industry. Id. at 96–97.

¹⁶²³ Id. at 79, 116–117.

¹⁶²⁴ Data Boiler Letter at 21–22.

¹⁶²⁵ Better Markets Letter at 8.

The Commission believes it is reasonable to permit Manual Order Events to be timestamped to the second, provided that CAT Reporters record and report the Electronic Capture Time in milliseconds. The Commission understands that the timing of Manual Order Events is inherently imprecise, and believes that requiring a timestamp to a level of granularity finer than one second is not likely to provide any additional information that will be useful to regulators. The Commission believes, however, that requiring the timestamp for the Electronic Capture Time to be recorded to the millisecond would not be burdensome and would help facilitate the reconstruction of Manual Order Events once the order is handled by an electronic system. While the Commission is not aware of any credible means or rationale to disguise electronic orders as manual orders to take advantage of the one second timestamp granularity, as suggested by a commenter, the Commission believes that the Participants should address potential methods of avoiding compliance generally as they develop their Compliance Rules.¹⁶²⁶

(2) Millisecond (or Finer) Timestamp Requirement for All Other Order Events

Commenters generally supported the proposed requirement that the timestamps for non-Manual Order Events be recorded to the millisecond.¹⁶²⁷ Two commenters also agreed with the requirement to provide timestamps in increments finer than milliseconds, to the extent a CAT Reporter already uses more granular timestamps.¹⁶²⁸ Two other commenters disagreed, however, arguing that costly systems changes would be required for regulatory reporting of these finer timestamps used in its normal practice, and that they would not be useful for regulatory

¹⁶²⁶ See CAT NMS Plan, supra note 5, at Section 3.11.

¹⁶²⁷ SIFMA Letter at 35; DAG Letter at 2; see also FIF Letter at 12, 80; STA Letter at 1 (supporting the DAG Letter's Exemptive Request Letter recommendations).

¹⁶²⁸ Better Markets Letter at 8; Data Boiler Letter at 21–22.

purposes.¹⁶²⁹ Finally, two commenters took the position that certain post-trade events should not be required to have a timestamp, or have a less granular timestamp than a millisecond, as this information is less time-sensitive than fully-electronic trading events.¹⁶³⁰

In response, the Participants maintained that the Plan's timestamp requirements for non-Manual Order Events were appropriate, but also noted that as CAT Reporters incorporate finer timestamps in their systems, the quality of CAT Data will increase correspondingly.¹⁶³¹

The Commission believes that requiring that non-manual Reportable Events be reported with timestamp of at least a millisecond in granularity will help ensure that regulators can sequence events with a reasonable degree of accuracy. Given the speed with which the industry currently handles orders and executes trades, it is important that the CAT utilize a timestamp that will enable regulators to reasonably sequence the order in which Reportable Events occur.¹⁶³²

The Commission believes that timestamps in increments greater than a millisecond would undermine the improved ability to sequence events with any reasonable degree of reliability.¹⁶³³

¹⁶²⁹ SIFMA Letter at 35; FIF Letter at 12. One commenter also requested clarification that the timestamp granularity requirement would be based on the functionality of the applicable CAT reporting system. See TR Letter at 7.

¹⁶³⁰ FIF Letter at 79, 99, 111, 116–17; SIFMA Letter at 35. FIF listed Reportable Events in a descending level of sensitivity: (1) fully electronic trading events; (2) electronic orders requiring manual intervention; (3) manual order events; (4) post-trade events. See FIF Letter at 116. However, another commenter stated that no one particular reportable event is more time-sensitive than the others for surveillance purposes. See Data Boiler Letter at 21.

¹⁶³¹ Response Letter I at 29.

¹⁶³² For example, the ability to reconstruct market activity, perform other detailed market analyses, or determine whether a series of orders rapidly entered by a particular market participant is manipulative or otherwise violates SRO rules or federal securities laws requires the audit trail to sequence each order and event accurately.

¹⁶³³ See Adopting Release, supra note 14, at 45762.

In response to commenters' suggestions that timestamps should not be required on manual orders and other post-execution events,¹⁶³⁴ the Commission notes that it has provided flexibility for Manual Order Events and for post-execution allocations to be reported with one second timestamps.¹⁶³⁵

In response to the commenters that stated it would be costly for CAT Reporters to report using timestamps to the same granularity they use in their normal practice,¹⁶³⁶ the Commission believes it is appropriate to make a clarifying change to the Plan. The CAT NMS Plan provides that to the extent that any CAT Reporter utilizes timestamps in increments finer than one millisecond such CAT Reporter must utilize such finer increment when reporting CAT Data to the Central Repository.¹⁶³⁷ Rule 613(d)(3), however, required that a finer increment must be used only to the extent that “the relevant order handling and execution systems of any CAT Reporter utilizes timestamps finer than a millisecond.”¹⁶³⁸ Accordingly, the Commission is amending Section 6.8(b) of the Plan to limit the circumstances in which a CAT Reporter must report using an increment finer than a millisecond to when a CAT Reporter utilizes a finer increment for its order handling and execution systems. The Commission finds that, this modification is appropriate in light of the increased burdens placed on CAT Reporters by the additional systems changes that would otherwise be required in order to report in finer increments. With this modification, reporting in a finer increment than a millisecond would not

¹⁶³⁴ FIF Letter at 79, 99, 111, 116–17; SIFMA Letter at 35.

¹⁶³⁵ See Section IV.D.4.d, supra.

¹⁶³⁶ SIFMA Letter at 35; FIF Letter at 12.

¹⁶³⁷ See CAT NMS Plan, supra note 5, at Section 6.8(b).

¹⁶³⁸ 17 CFR 242.613(d)(3).

be a costly undertaking, and the Commission therefore believes that this approach will improve the accuracy of order event records, particularly those occurring rapidly across multiple markets, without imposing undue burdens on market participants.

14. Upgrades and New Functionalities

Under Article VI of the CAT NMS Plan, the Plan Processor is responsible, in consultation with the Operating Committee, for establishing policies and procedures for implementing potential changes and upgrades to the CAT System and infrastructure, including “business as usual” changes and the addition of new functionalities.¹⁶³⁹ The CAT NMS Plan also requires that the Plan Processor ensure that the technical infrastructure is scalable from a capacity standpoint, adaptable to future technology developments, and technologically current.¹⁶⁴⁰

The Commission received two comments on the Plan provisions pertaining to upgrades and new functionalities. The first commenter expressed concern that the Plan provisions apply only to infrastructure improvements and not also to regulatory tools.¹⁶⁴¹ The second commenter, noting the importance of scalability, suggested that the Plan Processor be required to meet certain capacity requirements recommended by Industry Members.¹⁶⁴² The Participants did not respond to these comments.

¹⁶³⁹ See CAT NMS Plan, supra note 5, at Sections 6.1(d)(iv), (h)(i), (j), and (k). Appendix D provides additional detail about the obligations of the Plan Processor with respect to CAT Functional Changes, CAT Infrastructure Changes, and Testing of New Changes. See id. at Appendix D, Section 11.

¹⁶⁴⁰ See id. at Appendix C, Section A.5(a).

¹⁶⁴¹ See Data Boiler Letter at 34.

¹⁶⁴² See SIFMA Letter at 45.

The Commission believes that the Plan’s provisions with respect to potential upgrades and new functionalities are reasonable. The Commission notes that the Plan Processor is responsible for overseeing the day-to-day operations of CAT and, as such, should be well-positioned and informed to consider whether and when systems changes or upgrades are necessary, subject to consultation and approval by the Operating Committee.¹⁶⁴³ With respect to the development of new regulatory tools, the Commission notes that the Participants, as SROs, are responsible for developing appropriate regulatory tools and, to the extent they identify necessary enhancements to the CAT, the Commission expects the Participants to direct the Plan Processor to implement them.¹⁶⁴⁴ With respect to a commenter’s recommendation that the Plan Processor be required to meet certain capacity requirements to assure scalability, the Commission notes that one of the key considerations for the CAT is that it be flexible and scalable,¹⁶⁴⁵ and that the CAT NMS Plan already requires that the Plan Processor ensure that the Central Repository’s infrastructure is scalable to handle increased reporting volumes and enhancements to technology over time.¹⁶⁴⁶ As discussed in Section IV.H, the Commission is amending Section 6.6 of the Plan to require the Participants to submit to the Commission an annual evaluation of potential technology upgrades based on a review of technological developments over the preceding year, drawing on internal or external technological expertise.

¹⁶⁴³ See CAT NMS Plan, supra note 5, at Section 6.1(i)–(k), Appendix D, Section 11.

¹⁶⁴⁴ Rule 613(f) requires the Participants to develop and implement a surveillance system, or enhance existing surveillance systems that are reasonably designed to make use of the CAT Data. 17 CFR 242.613(f); see also CAT NMS Plan, supra note 5, at Section 6.9(c), Appendix D, Section 11.

¹⁶⁴⁵ See CAT NMS Plan, supra note 5, at Appendix C, Section 5.

¹⁶⁴⁶ See id. at Appendix C, Section A.5(a).

15. Technical Specifications

The CAT NMS Plan provides that the Plan Processor will publish Technical Specifications regarding the submission of data to the Central Repository that must be consistent with the requirements of Appendices C and D of the Plan.¹⁶⁴⁷ Under the Plan, as filed, the Plan Processor (i) will begin developing Technical Specifications for the submission of order data by Industry Members fifteen months before Industry Members are required to begin reporting to the Central Repository, (ii) will publish these Technical Specifications one year before Industry Members are required to begin reporting to the Central Repository, and (iii) will begin connectivity testing and accepting order data from Industry Members for testing purposes six months before Industry Members are required to begin reporting to the Central Repository.¹⁶⁴⁸ With respect to Customer Account Information, the Plan Processor will publish the Technical Specifications six months before Industry Members are required to report data to the Central Repository, and will begin connectivity and acceptance testing three months before Industry Members are required to report data to the Central Repository.¹⁶⁴⁹ The development of Technical Specifications for Participant submission of order data will commence ten months before Participants are required to report to the Central Repository, and will be published six months before Participants are required to report to the Central Repository.¹⁶⁵⁰ Commenters raised several concerns regarding the Technical Specifications.¹⁶⁵¹

¹⁶⁴⁷ See id. at Section 6.9.

¹⁶⁴⁸ See id. at Appendix C, Section C.10(b).

¹⁶⁴⁹ See id. at Appendix C, Section C.10(a).

¹⁶⁵⁰ See id. at Appendix C, Section C.10(b).

¹⁶⁵¹ FIF Letter at 36–38, 43–44; TR Letter at 4–6; UnaVista Letter at 2; Fidelity Letter at 3, 5–6.

a. Industry Input and Timing of Technical Specifications

One commenter emphasized the importance of having comprehensive Technical Specifications that incorporate feedback from industry.¹⁶⁵² Another commenter stated that because CAT is new and complex, time should be built into the schedule to permit two iterative reviews of the Technical Specifications before they are considered final.¹⁶⁵³ This commenter suggested that this review period should be no less than six months, arguing that the current timeframes to develop and test the Technical Specifications for the reporting of information to identify a Customer, in particular, are insufficient.¹⁶⁵⁴ Another commenter suggested that the review process with respect to Technical Specifications for reporting order data and information to identify a Customer should begin two months after a Plan Processor is selected and continue for nine months.¹⁶⁵⁵

One commenter recommended that the Technical Specifications for Industry Members be prepared concurrently with the Technical Specifications for Participants to provide them with more time to review and implement any necessary changes, particularly with regard to interfaces that the Participants and Industry Members will use.¹⁶⁵⁶ The commenter also recommended that

¹⁶⁵² TR Letter at 4.

¹⁶⁵³ FIF Letter at 37, 43–44. More specifically, the commenter recommended that the Plan Processor provide technical specifications for order processes and Customer and allocation reporting within two months after the Effective Date and allow CAT Reporters six months to review and comment on the Technical Specifications before they are finalized. FIF Letter at 37–38.

¹⁶⁵⁴ FIF Letter at 38.

¹⁶⁵⁵ TR Letter at 5. Thomson Reuters noted the review of Technical Specifications related to the expansion of OATS to all NMS equities took four months, and specifications for changes to EBS to support large trader reporting took ten months to finalize. Id.

¹⁶⁵⁶ FIF Letter at 36, 37–38; see also SIFMA Letter at 24.

the implementation schedule address allocation reporting and suggested that Technical Specifications for allocation reporting be provided at the same time as those for reporting order data and information to identify a Customer.¹⁶⁵⁷ The commenter also stated that very detailed and timely information regarding CAT interfaces, message, and file formats in the Technical Specifications are essential due to the aggressive timeline for implementation of CAT.¹⁶⁵⁸

In response to these commenters, the Participants acknowledged the importance of the development process for the Technical Specifications for all CAT Reporters and emphasized that in their discussions with the Bidders, they have made development of Technical Specifications a high priority.¹⁶⁵⁹ Although the Participants noted that the Plan would not prohibit the Plan Processor from concurrently developing the Participant and Industry Member Technical Specifications, they explained that “in light of various practical issues raised by the pending decisions regarding the selection of the Plan Processor, the Participants do not propose to amend the Plan to reflect an expedited schedule for the Industry Member Technical Specifications.”¹⁶⁶⁰

In their response to comments regarding industry input on the Technical Specifications, the Participants stated that they believe that iterative interactions regarding the Technical Specifications would be beneficial in optimizing the efficiency and quality of the final Technical Specifications.¹⁶⁶¹ The Participants further explained that Appendix C of the Plan contemplates the publication of iterative drafts of the Technical Specifications, with respect to the submission

¹⁶⁵⁷ FIF Letter at 37.

¹⁶⁵⁸ Id. at 91.

¹⁶⁵⁹ Response Letter I at 41.

¹⁶⁶⁰ Id.

¹⁶⁶¹ Id.

of order data, as needed before the final Technical Specifications are published, noting that this language provides the flexibility for iterative drafts, as necessary.¹⁶⁶²

In their response to comments, the Participants also recommended amendments to the Plan to better align the milestones related to the submission of order data to the Central Repository with the milestones for the submission of Customer Account Information to the Central Repository. Specifically, the Participants recommended explicitly including milestones for the beginning of the Plan Processor's development of Technical Specifications for the submission of Customer Account Information and for the publication of iterative drafts of such Technical Specifications.¹⁶⁶³ However, the Participants did not recommend aligning the timeframe for the publication of Technical Specifications for the submission of Customer Account Information (six months prior to when Industry Members are required to begin reporting to the Central Repository) with the timeframe for the publication of Technical Specifications for the submission of order data (one year prior to when Industry Members are required to begin reporting to the Central Repository), explaining that reporting order data to the CAT will be a significantly more complex process than reporting Customer Account Information and that therefore it is appropriate to allow Industry Members more time to review Technical Specifications and to begin testing their systems with regard to order data.¹⁶⁶⁴

The Commission recognizes the importance of providing sufficient opportunity for CAT Reporters to provide input as the Technical Specifications are developed. As noted by the Participants, Appendix C of the CAT NMS Plan, as recommended to be amended by the

¹⁶⁶² Id.

¹⁶⁶³ Response Letter II at 7–8.

¹⁶⁶⁴ Response Letter III at 12–13.

Participants in their response to comments,¹⁶⁶⁵ provides that, for the submission processes for both order data and information to identify a Customer, the Plan Processor will begin developing the Technical Specifications fifteen months prior to Industry Member reporting and will publish iterative drafts of the Technical Specifications as needed prior to the publication of the final Technical Specifications.¹⁶⁶⁶ In addition, the Participants stated that they will “work with the Plan Processor and the industry to develop detailed Technical Specifications.”¹⁶⁶⁷

Based on these provisions of the Plan and the Participants’ statements in their response, the Commission understands that the Participants will work with and consider input from Industry Members during the Technical Specification drafting and development processes. The Commission further understands that the milestones in the Plan regarding the development of the Technical Specifications will keep Industry Members reasonably informed as to the status and content of the Technical Specifications and will permit Industry Members, whether through the Advisory Committee or other, more informal mechanisms, to provide input on the Technical Specifications as they are being developed. As discussed above, the Plan requires the Participants and the Plan Processor to work with Industry Members in an iterative process, as necessary, to develop effective final Technical Specifications.¹⁶⁶⁸ However, the Commission believes that providing the Plan Processor with some flexibility regarding the mechanics of the Technical Specification development process is appropriate, and that it would be premature at

¹⁶⁶⁵ See supra note 1663 and accompanying text.

¹⁶⁶⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section C.10.

¹⁶⁶⁷ Response Letter II at 21.

¹⁶⁶⁸ See Section IV.D.8.b, supra.

this time to provide for mandatory iterative interactions or to require a specific number of iterations.

In addition, the Commission believes it will be beneficial for the milestones for the submission of order data and information to identify a Customer to be as aligned as possible so that all stakeholders can identify issues and present solutions on these related processes simultaneously. The Commission believes that the Participants' recommendations to include specific milestones for the commencement of the development of Technical Specifications for the submission of Customer Account Information and for the publication of iterative drafts of such Technical Specifications are reasonable, and is therefore amending the Plan accordingly.¹⁶⁶⁹ Although not specifically recommended in the Participant's response, the Commission is also amending the Plan to clarify that the milestones for the submission of information to identify a Customer apply to Customer Identifying Information as well as Customer Account Information.¹⁶⁷⁰ The Commission understands that the term Customer Identifying Information was inadvertently omitted from Appendix C, Section C.10(a), and therefore believes it is

¹⁶⁶⁹ Specifically, the Commission is amending Appendix C, Section C.10(a) of the Plan to state that the Plan Processor will begin developing the Technical Specifications for Industry Member reporting of Customer Account Information and Customer Identifying Information no later than fifteen months before Industry Members are required to begin reporting data to the Central Repository. The Plan Processor will also begin developing the Technical Specifications for order data reporting at that time. In addition, the Commission is amending Appendix C, Section C.10(a) of the Plan to state that the Plan Processor will publish iterative drafts of the Technical Specifications for Industry Member reporting of Customer Account Information and Customer Identifying Information, as well as Industry Member reporting of order data, as needed before the final versions of these Technical Specifications are published.

¹⁶⁷⁰ The milestones listed in Appendix C, Section C.10(a) apply to the customer definition process described in Section 6.4(d)(iv), which requires Industry Members to submit both Customer Account Information and Customer Identifying Information. See Section IV.D.4.a(1), supra.

appropriate to amend the Plan to add this term to the milestones applicable to the development of Technical Specifications for Customer data submission.

The Commission agrees with the Participants that the reporting of order data to the Central Repository is likely to be significantly more complex than the reporting of Customer Account Information and Customer Identifying Information to the Central Repository because of the greater number of data elements and reporting requirements for order data.¹⁶⁷¹ Therefore, the Commission believes it is reasonable for the milestones in Appendix C of the Plan to state that the Plan Processor will publish the Technical Specifications for the submission of order data prior to the publication of Technical Specifications for the submission of Customer Account Information and Customer Identifying Information to permit Industry Members to spend additional time reviewing the order data Technical Specifications and testing their order data submission systems and processes.

In response to the comments recommending that Technical Specifications for Participants and Industry Members be developed concurrently, the Commission agrees with the Participants that the completion dates associated with the development, iterative drafting, and final release of the Technical Specifications for both Participants and Industry Members set forth outer limits on when such milestones must be completed,¹⁶⁷² which would not preclude the concurrent development of Participant and Industry Member Technical Specifications. The Commission further agrees that such concurrent development could be beneficial since it would permit all stakeholders to be apprised of issues and to offer solutions simultaneously and, accordingly,

¹⁶⁷¹ See Section III.5.d, supra.

¹⁶⁷² See Section IV.D.8.a, supra (discussing Commission amendments to the Technical Specifications and other milestones set forth in Section C.10 of Appendix C).

encourages the Participants and the Plan Processor to develop the Technical Specifications in this manner, if feasible. However, given that the Plan Processor, which will be primarily responsible for developing the Technical Specifications, will not be selected until after the Plan is approved, and that the Plan Processor has a variety of other responsibilities related to the development of the CAT, the Commission believes that providing the Plan Processor with flexibility regarding the mechanics of the Technical Specification development process is reasonable and is not amending the Plan to require concurrent development of Participant and Industry Member Technical Specifications. Moreover, the Commission believes that the sequencing of Technical Specification milestones in the Plan—for example, that development of Technical Specifications for Participant reporting of order data to the Central Repository should begin ten months before Participants are required to begin reporting data to the Central Repository while development of Technical Specifications for Industry Member reporting of order data to the Central Repository should begin fifteen months before Industry Members are required to begin reporting data to the Central Repository¹⁶⁷³—reflects a reasonable prioritization in light of the phased implementation of Participant and Industry Member reporting.

Similarly, with respect to the period of time that Industry Members will have to review and provide input on the Technical Specifications for Industry Member data reporting, the Commission notes that, because the Plan Processor may begin developing the Technical Specifications earlier than fifteen months prior to Industry Member reporting, and because the Plan Processor may seek Industry Member comment on draft Technical Specifications, there

¹⁶⁷³ See CAT NMS Plan, *supra* note 5, at Appendix C, Section C.10.

may in effect be a period of Technical Specification review that is longer than suggested by a strict interpretation of the milestones in Appendix C. Therefore, the Commission is not amending the Plan to revise these timeframes.

However, as discussed above, the Commission expects that the Technical Specifications will be published with sufficient time for CAT Reporters to program their systems to satisfy their reporting obligations under the Plan and is amending Appendix C, Section C.10 of the Plan to ensure that the completion dates for the Technical Specification development milestones designate firm outer limits, rather than “projected” completion dates, for the completion of these milestones.¹⁶⁷⁴ Therefore, the Commission is amending the Plan to provide for a minimum period of three months during which the Plan Processor and Industry Members will work together to develop the Technical Specifications.¹⁶⁷⁵

b. Impact on Industry Members

One commenter stated that changes that SROs require of their members’ systems and processes can be costly in terms of both dollars and human capital.¹⁶⁷⁶ The commenter also noted that these changes are often subject to short implementation time periods and there is a lack of opportunity for discussion of concerns about the extent to which such new requirements can potentially expose the markets and investors to unnecessary risk.¹⁶⁷⁷ This commenter

¹⁶⁷⁴ See Section IV.D.8.a, supra.

¹⁶⁷⁵ As amended, the Plan will require that the Plan Processor will begin developing Technical Specifications for Industry Member submission of order data no later than fifteen months before Industry Members are required to begin reporting this data and will publish the final Technical Specifications no later than one year before Industry Members are required to begin reporting. Id.

¹⁶⁷⁶ Fidelity Letter at 6.

¹⁶⁷⁷ Id. at 3, 5–6.

recommended that any new CAT requirements that will be imposed by the Participants on broker-dealers should be done through the SRO rulemaking process to afford market participants the opportunity to discuss any proposed changes with the Participants and the Commission, and to provide a sufficient lead time to implement necessary systems and coding changes.¹⁶⁷⁸

The Participants explained in their response that they do not believe, generally, that the Technical Specifications are required to be filed with the Commission under Rule 608,¹⁶⁷⁹ and cautioned that requiring rule filings may introduce significant delays in the process of developing the Technical Specifications. The Participants stated that in the normal course they do not intend to file the Technical Specifications with the Commission, but noted that to the extent that a change to the Technical Specifications is significant enough to require a change to the Plan, then such an amendment to the Plan would be filed pursuant to Rule 608.¹⁶⁸⁰

As discussed above, the Commission recognizes the importance of providing sufficient opportunity for all CAT Reporters to provide input as the initial Technical Specifications are developed, and believes that the Technical Specification development process outlined in the Plan, as amended—including the iterative interactions discussed above—will provide such an opportunity.¹⁶⁸¹ The Commission believes that the completion dates for the availability of final Technical Specifications—e.g., no later than one year before Industry Members are required to report data to the Central Repository for the release of Technical Specifications governing Industry Member reporting of order data—are reasonable and provide Industry Members with

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Id.

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The Participants noted that technical specifications for other NMS plans, such as the Tick Size Pilot Plan, have not been filed with the SEC. Response Letter I at 42.

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Response Letter I at 42.

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See Section IV.D.15.a, supra.

sufficient lead time to adjust their systems or make other preparations necessary to comply with the Technical Specifications, particularly since drafts of the Technical Specifications will likely have been available even earlier and Industry Members will have been involved in the process of developing the Technical Specifications.¹⁶⁸²

The Commission recognizes that there may be costs associated with complying with technical or operational changes in reporting requirements. The Commission notes that Material Amendments to the Technical Specifications—i.e., amendments that would “require a Participant or an Industry Member to engage in significant changes to the coding necessary to submit information to the Central Repository”—must be approved by a Supermajority Vote of the Operating Committee, so the Plan provides additional controls with respect to changes to the Technical Specifications that could potentially be costly.¹⁶⁸³ In addition, the Advisory Committee, which includes Industry Member representation, will be able to raise Industry Member concerns regarding any unexpected or costly requirements in the Technical Specifications with the Operating Committee. Moreover, while the Commission agrees with the Participants that changes to the Technical Specifications generally will not be required to be filed with the Commission, the Participants must comply with the CAT NMS Plan as approved by the Commission,¹⁶⁸⁴ which constrains the ability of the Operating Committee to approve major changes that would alter the scope of the CAT NMS Plan through Technical Specifications. In

¹⁶⁸² See CAT NMS Plan, supra note 5, at Appendix C, Section C.10. The Commission also believes that the details regarding data reporting and recording included in the CAT NMS Plan itself are sufficient for CAT Reporters to begin the process of preparing their systems for CAT reporting.

¹⁶⁸³ See id. at Section 6.9(c).

¹⁶⁸⁴ 17 CFR 242.613(h)(1).

addition, the Commission will oversee the Participants' compliance with the Plan,¹⁶⁸⁵ which provides an additional protection against the Participants or Plan Processor attempting to include changes in the Technical Specifications that properly should be filed as Plan amendments.

c. Technical Specifications Content

Several commenters noted that the Technical Specifications for CAT must be robust and comprehensive.¹⁶⁸⁶ Some commenters recommended that specific elements be included in the Technical Specifications.¹⁶⁸⁷ One commenter recommended that the Participants ensure the Technical Specifications include provisions to ensure that multiple service providers are able to connect to CAT to report CAT Data.¹⁶⁸⁸ Another commenter stressed the importance of including connectivity requirements in the Technical Specifications.¹⁶⁸⁹ This commenter also stated that achievement of the CAT NMS Plan's reporting requirement would be dependent on the details in the Technical Specifications.¹⁶⁹⁰ Another commenter stated that while it supports the reporting procedures identified in the CAT NMS Plan, "clearly defined technical guidelines for field specifications under different trading scenarios" are also needed.¹⁶⁹¹ A different

¹⁶⁸⁵ See 17 CFR 242.608(b)(2), (c), (d); 17 CFR 242.613(h).

¹⁶⁸⁶ TR Letter at 5; FIF Letter at 91; UnaVista Letter at 2.

¹⁶⁸⁷ TR Letter at 5 (recommending that the CAT Technical Specifications should include all scenarios currently covered in the OATS technical specification as well as additional scenarios on new processes related to the Customer definition process and options order reporting and that all scenarios required to meet the CAT NMS Plan Appendix D, Reporting & Linkage Requirements should be considered including step-outs, cancel-rebills, bunched orders and manual order processing); UnaVista Letter at 2.

¹⁶⁸⁸ TR Letter at 5.

¹⁶⁸⁹ FIF Letter at 124, 128.

¹⁶⁹⁰ Id. at 124.

¹⁶⁹¹ UnaVista Letter at 2 (noting further that CAT certification courses, webinars, user groups and a forum for FAQs may improve knowledge transfer).

commenter stated that the items to be included in the Technical Specifications “inappropriately constrain” the design of the CAT system to “too rigidly follow a traditional SQL database design” to the exclusion of more sophisticated analytical approaches.¹⁶⁹²

In response, the Participants explained that they believe that each of these items are more appropriately addressed in the Technical Specifications, and should not be incorporated as requirements of the Plan. Nevertheless, the Participants explained that they believe that each of the elements identified by the commenters will be incorporated into the Technical Specifications developed by the Plan Processor.¹⁶⁹³

The Commission acknowledges the importance of timely, comprehensive, and detailed Technical Specifications that will provide all CAT Reporters with effective guidance on how to report data to the Central Repository. The Commission notes that the CAT NMS Plan specifies a number of parameters for what the Technical Specifications must contain, including specifications for the layout of files and records submitted to the Central Repository and the process for file submissions.¹⁶⁹⁴ The Commission believes that it may be beneficial to include the elements referenced by the commenters, such as details regarding the submission of data for the Customer definition process and options order reporting, in the Technical Specifications, but believes that it is reasonable to allow the Plan Processor, with input from Industry Members during the iterative drafting process, to have some flexibility in determining these details of the Technical Specifications. In addition, the Participants have indicated that the elements referenced by the commenters will be incorporated into the Technical Specifications, and

¹⁶⁹² Data Boiler Letter at 9–10.

¹⁶⁹³ Response Letter I at 40.

¹⁶⁹⁴ See CAT NMS Plan, supra note 5, at Section 6.9(b).

therefore the Commission does not believe it is necessary to amend the Plan to require these elements.

In response to the comment that the Plan's parameters regarding the content of the Technical Specifications are too rigid and limit the ability of the Plan Processor to offer certain design solutions, the Commission believes that the parameters strike an appropriate balance between providing the Bidders flexibility to offer a variety of solutions on the one hand and including some baseline requirements for the Technical Specifications on the other, and does not believe these parameters will inappropriately constrain the solutions that the Plan Processor can develop.

E. Capital Accounts, Allocations of Income and Loss, and Distributions (Articles VII and VIII)

As filed, the CAT NMS Plan provides that the Operating Committee must approve by Supermajority Vote a distribution of cash and property of the Company to the Participants.¹⁶⁹⁵ To the extent a distribution is made, all Participants must participate equally in any such distribution, except as otherwise provided in the CAT NMS Plan.¹⁶⁹⁶ The CAT NMS Plan, as filed, also includes provisions relating to each Participant's Capital Account, and how net profits and net losses (and any other item allocable to the Participants) shall be allocated to the Participants.¹⁶⁹⁷

¹⁶⁹⁵ See CAT NMS Plan, supra note 5, at Section 8.5(a).

¹⁶⁹⁶ Id.

¹⁶⁹⁷ See id. at Article VIII.

Three commenters raised concerns about the CAT NMS Plan’s proposed allocations of profit and loss, particularly concerning the ability of the Participants to profit from CAT.¹⁶⁹⁸

Two commenters argued that the CAT NMS Plan should be amended to state that any profits arising out of the CAT may not be used to fund the Participants’ other operations.¹⁶⁹⁹ One of the commenters also stated that the CAT should operate at-cost¹⁷⁰⁰ and that funding related to the CAT should not create a surplus for the Participants.¹⁷⁰¹

Another commenter noted that the proposed funding model would allocate net profits or net losses only to Participants, even though both Participants and broker-dealers would be funding the Central Repository.¹⁷⁰² The commenter deemed this inequitable and suggested that any profits should be distributed back to all entities that fund the CAT, not just the Participants.¹⁷⁰³ This commenter believed that the CAT should function as a non-profit industry utility, distributing profits to all entities funding the CAT and raising fees if there are any losses.¹⁷⁰⁴

In response, the Participants stated that the Company is expected to be operated on a “break-even” basis, with fees imposed to cover costs and an appropriate reserve, and explained that any surpluses would be treated as an operational reserve to offset future fees and would not

¹⁶⁹⁸ SIFMA Letter; KCG Letter; DAG Letter.

¹⁶⁹⁹ SIFMA Letter at 19; DAG Letter at 5.

¹⁷⁰⁰ SIFMA Letter at 29.

¹⁷⁰¹ Id. at 14.

¹⁷⁰² KCG Letter at 5.

¹⁷⁰³ Id.

¹⁷⁰⁴ Id.

be distributed to the Participants as profits.¹⁷⁰⁵ In addition, the Participants stated that they received advice from counsel to CAT NMS, LLC that the Company could qualify for tax exempt status as a “business league” under Section 501(c)(6) of the Internal Revenue Code and decided to have the Company apply for such status to allow it to establish reserves from the fees paid to the Company without incurring income taxes on those amounts.¹⁷⁰⁶ Accordingly, to ensure that the Company can qualify for the business league exemption, the Participants proposed that the Commission amend the Plan so that the Company is treated as a corporation for U.S. tax purposes, that distributions, if any, are made consistent with the purposes of Section 501(c)(6) of the Internal Revenue Code, and that certain other Plan provisions related to distributions to the Participants or to the taxation of the Company as a partnership for U.S. tax purposes be eliminated.¹⁷⁰⁷ In particular, the Participants suggested that the Commission amend the Plan to delete in its entirety Article VII, which pertains to Capital Accounts maintained by the Company for each Participant, and to replace Article VIII, which pertains to allocations of income and loss and distributions, with a provision stating that the Company intends to operate in a manner such that it qualifies as a business league within the meaning of Section 501(c)(6) of the Internal Revenue Code, and requiring the Operating Committee to submit an application to the Internal Revenue Service to attain such status for the Company.¹⁷⁰⁸

¹⁷⁰⁵ Participants’ Letter I at 1.

¹⁷⁰⁶ Id.

¹⁷⁰⁷ Id.

¹⁷⁰⁸ See id. The Participants also suggested conforming amendments to: Article I, to remove the definition of Capital Account; Article II, to state that the Company’s activities also shall be consistent with its tax exempt status; Articles III, IX, and XII and Appendix C to eliminate certain references to the Participants’ Capital Accounts and provisions regarding the Company’s potential taxation as a partnership and its distributions and

The Commission believes that the Participants' stated intent to operate the CAT on a break-even basis is appropriate. Inasmuch as the CAT is a regulatory tool mandated under Rule 613, it should not be used to fund the SROs' other operations. To ensure the CAT is operated in this manner, the Commission is amending Section 11.1(c) of the CAT NMS Plan to require that any surplus of the Company's revenues over its expenses will be treated as an operational reserve to offset future fees. The Commission believes this amendment is reasonable because it formalizes the representation made by the Participants, and provides certainty that the Participants' operation of the CAT will not contribute to the funding of their other operations. The Commission notes that, under the Exchange Act, any fees proposed to be charged by the Participants to fund the CAT must be filed as proposed rule changes pursuant to Rule 19b-4(f)(2) or filed pursuant to Rule 608(b)(3)(i)¹⁷⁰⁹ with the Commission, published for public comment,

allocations; and Article X, to state that certain distributions after an event of dissolution shall be made to such persons or institutions as is consistent with the purposes of the Company and with Section 501(c)(6) of the Internal Revenue Code. See id.

¹⁷⁰⁹ See 15 U.S.C. 78s(b)(3)(A)(ii); 17 CFR 242.608(b)(3)(i). The Commission notes that, although Section 11.1(b) of the CAT NMS Plan states that the Participants will file fees for Industry Members pursuant to Section 19(b) of the Exchange Act, the Participants could choose to submit the proposed fee schedule to the Commission as individual SROs pursuant to Rule 19b-4 under the Exchange Act or jointly as Participants to an NMS plan pursuant to Rule 608 of Regulation NMS. See 17 CFR 240.19b-4; 17 CFR 242.608. Because the proposed fee schedule would establish fees, whether the Participants individually file it pursuant to Section 19(b)(3)(A)(ii) of the Act, or jointly file it pursuant to Rule 608(b)(3)(i) of Regulation NMS, the proposed fee filings will be eligible for immediate effectiveness. See 15 U.S.C. 78s(b)(3)(A)(ii); 17 CFR 242.608(b)(3)(i). The Commission also notes that publication will be subject to the filing of the fee proposal by the Participants that satisfies the requirements of the Exchange Act. If the Participants file the proposed fee schedule pursuant to Rule 19b-4(f)(2) and the Commission deems such fees not to meet applicable statutory standards, the Commission summarily may temporarily suspend the fees if it appears to the Commission that such action is necessary or appropriate in the public interest, for the protection of investors, or otherwise in furtherance of the purposes of the Exchange Act. See 15 U.S.C. 78s(b)(3)(C). If the Commission takes such action, the Commission shall institute proceedings under Section

and meet statutory standards with respect to reasonableness, equitable allocation, and other matters.¹⁷¹⁰

The Commission believes that it is reasonable to amend the Plan as filed by the Participants to treat CAT NMS, LLC as a tax exempt business league under Section 501(c)(6) of the Internal Revenue Code.¹⁷¹¹ The Commission believes that allowing the Company to establish reserves from the fees paid to the Company without incurring income taxes on those reserves would be more efficient and could potentially make more funding available to pay for the development and operation of the CAT or reduce fees. Further, the Commission believes that that the Company's application for Section 501(c)(6) business league status addresses issues raised by commenters about the Plan's proposed allocations of profit and loss by mitigating concerns that the Company's earnings could be used to benefit individual Participants.¹⁷¹² Accordingly, the Commission is amending the Plan as filed by the Participants to delete in its entirety Article VII, which pertains to Capital Accounts maintained by the Company for each Participant, and to replace Article VIII, which pertains to allocations of income and loss and

19(b)(2)(B) to determine whether the proposed rule should be approved or disapproved. See 15 U.S.C. 78s(b)(3)(A). If the Participants file the proposed fee schedule pursuant to Rule 608(b)(3)(i), the Commission may summarily abrogate the fees and require them to be refiled in accordance with Rule 608(a)(1) and reviewed in accordance with Rule 608(b)(2) if it appears to the Commission that such action is necessary or appropriate in the public interest, for the protection of investors, or the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system or otherwise in furtherance of the purposes of the Exchange Act. See 17 CFR 242.608(b)(3)(iii).

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Id.

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The Commission defers, however, to the Internal Revenue Service regarding whether CAT NMS, LLC meets all the necessary requirements to so qualify.

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To qualify as a business league, an organization must “not [be] organized for profit and no part of the net earnings of [the organization can] inure[] to the benefit of any private shareholder or individual.” 26 U.S.C. § 501(c)(6).

distributions, with a provision stating that the Company intends to operate in a manner such that it qualifies as a business league and that the Operating Committee will apply to attain such status for the Company. The Commission is also amending the Plan to make the conforming amendments to Articles I–III, IX, X, and XII and Appendix C as suggested by the Participants.¹⁷¹³

F. Funding of the Company (Article XI)

The CAT NMS Plan contemplates a bifurcated funding model, where costs associated with building and operating the Central Repository would be borne by (1) Participants and Industry Members that are “Execution Venues”¹⁷¹⁴ through fixed tier fees, and (2) Industry Members (other than ATs), through fixed tier fees based on message traffic.¹⁷¹⁵ With respect to Execution Venues, the Operating Committee will establish at least two, and no more than five, tiers of fixed fees based on the Execution Venue’s NMS Stock and OTC Equity Securities market share, as calculated by share volume.¹⁷¹⁶ Execution Venues that execute transactions in Listed Options will pay a fixed fee depending on the Listed Options market share of such Execution Venue, with the Operating Committee establishing at least two, and no more than five, tiers of fixed fees based on an Execution Venue’s Listed Options market share, as calculated by

¹⁷¹³ See supra note 1708.

¹⁷¹⁴ The CAT NMS Plan defines “Execution Venue” as “a Participant or an alternative trading system (“ATS”) (as defined in Rule 300 of Regulation ATS) that operates pursuant to Rule 301 of Regulation ATS (excluding any such ATS that does not execute orders).” See CAT NMS Plan, supra note 5, at Section 1.1. The CAT NMS Plan categorizes FINRA as an Execution Venue because it has trades reported by its members to its trade reporting facilities (“TRFs”) for reporting transactions effected otherwise than on an exchange. See id. at Section 11.3(i).

¹⁷¹⁵ See id. at Section 11.3(a)(i)–(ii); Section 11.3(b); Appendix C, at Section B.7(b)(iv)(B).

¹⁷¹⁶ See id. at Section 11.3(a)(i).

contract volume.¹⁷¹⁷ With respect to Industry Members, the Plan provides that the Operating Committee will establish fixed fees to be payable by Industry Members based on the message traffic generated by such Industry Member. In addition to the message traffic fees for the non-ATS activities of Industry Members, the Plan provides that message traffic fees will be assessed on message traffic generated by: (i) an ATS that does not execute orders and that is sponsored by such Industry Member; and (ii) routing orders to and from any ATS sponsored by such Industry Member. The Operating Committee will establish at least five, and no more than nine, tiers of fixed fees based on message traffic.¹⁷¹⁸

1. Funding Model Generally

Several commenters argued that the proposed funding model unfairly or inappropriately allocates costs to Industry Members and away from Participants.¹⁷¹⁹ One commenter believed that the Commission should consider whether Industry Members should fund the costs of CAT at all.¹⁷²⁰

Some commenters stated that requiring the creation and maintenance of a Participant-owned and -operated system like CAT to be partially funded by Industry Members would be a significant departure from the funding models currently used for existing regulatory systems.¹⁷²¹

¹⁷¹⁷ See id. at Section 11.3(a)(ii).

¹⁷¹⁸ See id. at Section 11.3(b); Appendix C, Section B.7(b)(iv)(B).

¹⁷¹⁹ KCG Letter at 3; DAG Letter at 4; see also FSR Letter at 9–10 (noting the ultimate cost of the CAT will be in the billions of dollars, “which will be passed-down to the Industry Members and investors through new fees”).

¹⁷²⁰ DAG Letter at 4; see also STA Letter at 1 (supporting the DAG Letter’s cost and funding recommendations).

¹⁷²¹ SIFMA Letter at 14 (noting that the Participants fund similar systems like OATS themselves and then a portion of those costs are borne by Industry Members through fees); DAG Letter at 5.

One of these commenters believed that the Participants should justify the need for Industry Members to fund the creation and ongoing costs of the CAT.¹⁷²² The commenter opposed any Participant-imposed fee for the CAT,¹⁷²³ and stated that the CAT NMS Plan does not distinguish between the costs of the CAT that are associated with Industry Member data reporting and costs associated with the Participants' regulatory uses.¹⁷²⁴ This commenter further stated that the funding authority of the CAT should extend only to expenses directly related to the reasonable implementation and operating costs of the CAT system, such as costs related to the management of the business of the CAT, and the direct costs of building and maintaining of the Central Repository.¹⁷²⁵ The commenter specifically opposed the Participants' proposal to recover the costs of the creation or development of the CAT NMS Plan, such as legal and consulting costs, and expressed the view that these costs are solely the responsibility of the Participants as part of their regulatory cost of doing business.¹⁷²⁶ Further, this commenter suggested that the governance structure include an audit committee to assure that the CAT's revenue is used for regulatory purposes.¹⁷²⁷

¹⁷²² SIFMA Letter at 14.

¹⁷²³ Id.

¹⁷²⁴ Id. at 17. The commenter further noted that the Plan does not address how new costs resulting from regulatory research needs are allocated, providing as an example if the Commission requested a significant increase in the Central Repository's processing capability to facilitate a large-scale analysis related to a market structure study, opining that it would be inappropriate to require Industry Members to pay for Participant-specific system enhancements through the general allocation of CAT costs. Id. at 18.

¹⁷²⁵ Id. at 15.

¹⁷²⁶ Id.; see also DAG Letter at 4–5.

¹⁷²⁷ SIFMA Letter at 29.

Finally, two commenters believed that, to the extent the CAT generates cost savings for the Participants, that cost savings should be used first to fund the CAT before fees are imposed on Industry Members.¹⁷²⁸

In response, the Participants stated that Rule 613 specifically contemplated the allocation of the costs of the creation, implementation and maintenance of the CAT among both the Participants and their members, and that the Adopting Release for Rule 613 discussed and permitted the recovery of such costs by Participants from their members.¹⁷²⁹ Additionally, with respect to the comments that objected to Participants using fees under the Plan to recover development costs of the Plan, and in particular legal and consulting costs, the Participants explained that Rule 613 permitted the Participants to propose to recover such costs.¹⁷³⁰ The Participants stated their belief that it is equitable that the Industry Members as well as Participants contribute to the funding of the CAT, including the development of the Plan governing the CAT,¹⁷³¹ because both benefit from the enhanced market oversight afforded regulators by the CAT,¹⁷³² and noted that adopting CAT-specific fees would provide greater transparency for market participants than a general regulatory fee.¹⁷³³

¹⁷²⁸ SIFMA Letter, DAG Letter; see also STA Letter at 1 (supporting the DAG Letter’s cost and funding recommendations).

¹⁷²⁹ Response Letter II at 9–10 (citing 17 CFR 242.613(a)(1)(vii)(D) and Adopting Release, supra note 14, at 45795).

¹⁷³⁰ Response Letter II at 13.

¹⁷³¹ Id.

¹⁷³² Id. at 10.

¹⁷³³ Id.

In response to the commenters that suggested that the CAT be funded, at least in part, by cost savings,¹⁷³⁴ the Participants acknowledged that cost savings from retiring existing systems will partially offset their expenses associated with the CAT, but declined to make any specific funding commitments.¹⁷³⁵

The Participants, as SROs, have traditionally recovered their regulatory costs through the collection of fees from their members, and such fees are specifically contemplated by the Exchange Act.¹⁷³⁶ The Participants currently collect certain regulatory and other fees, dues and assessments from their members to fund their SRO responsibilities in market and member regulation; such fees must be consistent with applicable statutory standards under the Exchange Act, including being reasonable, equitably allocated¹⁷³⁷ and not unfairly discriminatory.¹⁷³⁸

¹⁷³⁴ SIFMA Letter at 17–18; DAG Letter at 4.

¹⁷³⁵ Response Letter II at 16. Specifically, the Participants stated that they expect to realize approximately \$10.6 million in cost savings associated with the retirement of existing systems when moving to the CAT. However, they also said that they will incur approximately \$17.9 million in expenses associated with complying with the CAT reporting requirements, and an additional \$23.2 million in expenses related to the implementation of surveillance programs.

¹⁷³⁶ Sections 6(b)(1) and 15A(b)(2) of the Exchange Act require that an exchange or association have the capacity to be able to carry out the purposes of the Exchange Act, the rules and regulations thereunder, and the rules of the exchange or association. 15 U.S.C. 78f(b)(1); 15 U.S.C. 78o-3(b)(2). See e.g., Schedule A to the By-Laws of FINRA, Section 1(a) (stating “FINRA shall, in accordance with this section, collect member regulatory fees that are designed to recover the costs to FINRA of the supervision and regulation of members, including performing examinations, financial monitoring, and policy, rulemaking, interpretive, and enforcement activities”). As SROs, the Participants have an obligation to be so organized and have the capacity to be able to carry out the purposes of the Exchange Act, and to enforce compliance by their members with the Exchange Act and their rules. 15 U.S.C. 78f(b)(1); 15 U.S.C. 78o-3(b)(2).

¹⁷³⁷ 15 U.S.C. 78f(b)(4); 15 U.S.C. 78o-3(b)(5).

¹⁷³⁸ 15 U.S.C. 78f(b)(5); 15 U.S.C. 78o-3(b)(6).

The Commission believes that the proposed funding model reflects a reasonable exercise of the Participants' funding authority to recover the Participants' costs related to the CAT. The CAT is a regulatory facility jointly owned by the Participants and, as noted above, the Exchange Act specifically permits the Participants to charge members fees to fund their self-regulatory obligations. The Commission further believes that the proposed funding model is designed to impose fees reasonably related to the Participants' self-regulatory obligations because the fees would be directly associated with the costs of establishing and maintaining the CAT, and not unrelated SRO services. The Commission emphasizes that the CAT NMS Plan does not set forth, and the Commission is not hereby approving, the specific fees to be charged by the Participants; rather, such fee proposals later will be separately filed with the Commission by the Participants, published for public comment, and assessed by the Commission for consistency with applicable Exchange Act standards, including whether they are reasonable and equitably allocated,¹⁷³⁹ and not unfairly discriminatory.¹⁷⁴⁰

2. Funding Model's Allocation of Costs

Several commenters expressed concern about the proposed allocation of CAT costs between the Participants and Industry Members.¹⁷⁴¹ Some expressed concern that the majority of the costs of the CAT would be allocated to Industry Members, with some estimating that Industry Members would pay approximately 88% of the ongoing annual costs of the CAT.¹⁷⁴²

¹⁷³⁹ 15 U.S.C. 78f(b)(4); 15 U.S.C. 78o-3(b)(5).

¹⁷⁴⁰ 15 U.S.C. 78f(b)(5); 15 U.S.C. 78o-3(b)(6).

¹⁷⁴¹ KCG Letter; SIFMA Letter; Fidelity Letter; FSR Letter; DAG Letter; Data Boiler Letter; Wachtel Letter.

¹⁷⁴² See DAG Letter at 4 (noting that the CAT NMS Plan estimates that 88% of the annual costs of CAT would be allocated to Industry Members, and that the Participants

One commenter stated that the funding model is “excessively and unjustifiably weighted to broker-dealers,”¹⁷⁴³ and requested to review proposed CAT fees to ensure they are reasonable and equitable.¹⁷⁴⁴ Another commenter expressed concern that the costs and funding of CAT might not be allocated equitably among Industry Members and Participants, given that the Participants are sole voting members of the Plan.¹⁷⁴⁵

More generally, two commenters believed that the CAT NMS Plan’s funding model lacks sufficiently detailed information.¹⁷⁴⁶ One of the commenters stated that the Plan’s funding model does not adequately represent the industry feedback that the group provided to the Participants, and noted that the CAT NMS Plan lacks an analysis of how a CAT fee would fit into the existing funding model for regulation, including whether FINRA trading activity fees would be reduced after OATS is retired.¹⁷⁴⁷ Another commenter stated that the information

additionally intend to require Industry Members to help fund the creation and ongoing costs of CAT, significantly increasing the burden on Industry Members); KCG Letter at 4; SIFMA Letter at 12–13 (noting that the total estimated annual cost of the CAT NMS Plan would be \$1.7 billion, of which \$1.5 billion, or 88% of the costs for the operation of CAT, would be borne by Industry Members). One of these commenters stated that, although not mentioned in the CAT NMS Plan, it believed the Participants anticipate allocating 75% of CAT Central Repository build and operational costs to Industry Members and 25% to Execution Venues, thereby shifting the majority of CAT costs away from the SROs and on the Industry Members, and increasing the Industry Member portion of annual CAT-related costs from approximately 88% to more than 96%. KCG Letter at 4. That commenter stated that “[t]his methodology is inequitable and serves to underscore the inherent conflicts of interest the SROs face with respect to CAT funding and the effects of precluding broker-dealers from meaningfully participating in management of the CAT.” KCG Letter at 4–5.

¹⁷⁴³ SIFMA Letter at 13.

¹⁷⁴⁴ *Id.* at 18.

¹⁷⁴⁵ Fidelity Letter at 5.

¹⁷⁴⁶ SIFMA Letter; DAG Letter.

¹⁷⁴⁷ DAG Letter at 5.

made publicly available in the CAT NMS Plan is insufficient for it to provide meaningful analysis on the funding model.¹⁷⁴⁸

The Participants disputed the estimate quoted by several commenters that Industry Members would bear 88% of the costs of the CAT, stating that this calculation referred to Industry Member compliance costs, and does not directly reflect CAT fees to be imposed pursuant to the Plan.¹⁷⁴⁹

In response to the commenter that asked whether existing regulatory fees would be reduced once the CAT is implemented,¹⁷⁵⁰ the Participants stated that each SRO will consider potential revisions to its existing regulatory fees once the CAT begins operation and legacy systems are retired.¹⁷⁵¹ The Participants also disagreed with the commenters that expressed concern that the funding model does not adequately reflect industry input,¹⁷⁵² and stressed that the funding model was discussed with the DAG many times and that the funding model was developed taking into account their input.¹⁷⁵³

The Commission believes that the proposed funding model is reasonably designed to allocate the costs of the CAT between the Participants and Industry Members. The Commission

¹⁷⁴⁸ SIFMA Letter at 16. This commenter noted that the CAT NMS Plan provides only a high-level description of a funding model that reflects no input from broker-dealers and contains very little information on how costs will be allocated between broker-dealers and Participants. *Id.* at 13.

¹⁷⁴⁹ Response Letter II at 10. The Participants stated that the funding model provides a framework for the recovery of the costs to create, develop and maintain the CAT, and is not meant to address the cost of compliance for Industry Members and Participants with the reporting requirements of Rule 613.

¹⁷⁵⁰ DAG Letter at 5.

¹⁷⁵¹ Response Letter II at 17–18.

¹⁷⁵² SIFMA Letter at 13; DAG Letter at 4.

¹⁷⁵³ Response Letter II at 18.

notes that the proposed funding model set forth in the Plan does not specify that the Participants or Industry Members would bear any particular percentage allocation of the costs associated with building and operating the Central Repository. As noted above, the Participants are permitted to recoup their regulatory costs under the Exchange Act through the collection of fees from their members, as long as such fees are reasonable, equitably allocated¹⁷⁵⁴ and not unfairly discriminatory, and otherwise are consistent with Exchange Act standards.¹⁷⁵⁵ The Commission will have the opportunity, at a later date, to review, and Industry Members and other interested persons will have the opportunity to comment upon, the specific fees the Participants intend to impose pursuant to the general funding model discussed herein.¹⁷⁵⁶

3. Message Traffic and Market Share Distinction

Two commenters addressed the proposed allocation of costs between Execution Venues and Industry Members based on market share and message traffic, respectively.¹⁷⁵⁷ One of the commenters questioned the allocation of costs to Industry Members by message-traffic tiers, noting that market makers in exchange-traded products (“ETPs”) could incur much greater allocated costs than market makers in corporate stocks, given that market makers in ETPs may generate ten times the amount of message traffic per executed trade as market makers in corporate stocks.¹⁷⁵⁸ The commenter also noted that Industry Members that primarily take

¹⁷⁵⁴ 15 U.S.C. 78f(b)(4); 15 U.S.C. 78o-3(b)(5).

¹⁷⁵⁵ 15 U.S.C. 78f(b)(5); 15 U.S.C. 78o-3(b)(6).

¹⁷⁵⁶ See Section IV.F.1, supra.

¹⁷⁵⁷ SIFMA Letter at 16–17; Data Boiler Letter at 15; see also DAG Letter at 5 (urging additional transparency related to the funding model based on market share and message traffic).

¹⁷⁵⁸ SIFMA Letter at 17.

liquidity do not generate significant quote-message traffic, so that “any mechanism that allocates costs to broker-dealers strictly based on message traffic would unfortunately disadvantage broker-dealers that typically provide liquidity compared to those that may only take liquidity,”¹⁷⁵⁹ thereby discouraging the display of quotes. The commenter expressed concern that the Plan does not explain how much the Participants would charge per message or per market share percentage, or how they would assign the fixed-fee tiers to exchanges and Industry Members.¹⁷⁶⁰

This commenter also noted that the CAT NMS Plan does not distinguish between costs of the CAT that are related to Industry Member data collection and processing, and costs of the CAT related to SRO surveillance and research, and expressed the view that allocating CAT costs simply based on message traffic or market share would make Industry Members subsidize Participant surveillance systems and other regulatory functions that currently are funded by the Participants through other regulatory fees imposed on Industry Members.¹⁷⁶¹ Finally, this commenter stated that the CAT NMS Plan does not explain why the SROs propose to allocate costs by message-traffic tiers for non-ATS Industry Members and by market share for exchanges and ATSS, and expressed concern that the market share approach applicable to exchanges and ATSS is primarily driven by their ability to pay, as opposed to the actual costs they impose on the Central Repository.¹⁷⁶²

1759

Id.

1760

Id. at 16.

1761

Id. at 17–18.

1762

Id. at 16–17. The commenter urged the Participants to explain why they would not use the market share method of allocation for non-ATS Industry Members.

Another commenter expressed the view that the proposed allocation of fees among Participants, other types of Execution Venues and Industry Members is not fair,¹⁷⁶³ and that assessing fees based on message traffic and market share is not appropriate or reasonable.¹⁷⁶⁴ This commenter stated that charging for message traffic would amount to a “financial transaction tax” that would negatively impact the financial markets, and recommended that charges instead be based on “quarantine or red-flag of suspicious trade messages.”¹⁷⁶⁵

In response, the Participants explained that “[i]n designing a funding model, the Participants have sought to ensure an equitable allocation of fees such that large broker-dealers or broker-dealer complexes and large Participants or Participant complexes pay more than small broker-dealers and small exchanges.”¹⁷⁶⁶ The Participants believe that there is a strong correlation between message traffic and the size of an Industry Member, and that Industry Members increase their message traffic volume as they grow.¹⁷⁶⁷ The Participants stated that message traffic is a key component of the costs of operating the CAT, so they believe that message traffic is an appropriate criterion for placing Industry Members in a certain fee tier.¹⁷⁶⁸ The Participants also expressed the view that the correlation between message traffic and size does not apply to Execution Venues, which they describe as producing similar amounts of message traffic regardless of size. They explained that charging Execution Venues based on message traffic would make large and small Execution Venues pay comparable fees, which they

¹⁷⁶³ Data Boiler Letter at 15.

¹⁷⁶⁴ Id.

¹⁷⁶⁵ Id.

¹⁷⁶⁶ Response Letter II at 11.

¹⁷⁶⁷ Id.

¹⁷⁶⁸ Id.

believe would be an inequitable result,¹⁷⁶⁹ so the Participants decided to treat Execution Venues differently from Industry Members in the funding model.¹⁷⁷⁰ The Participants estimated that the result of the funding model would be that fees for the smallest Execution Venues would be comparable to the largest Industry Members, and that aggregate fees for Participant complexes¹⁷⁷¹ would be at least comparable to those of large Industry Members.¹⁷⁷²

In response to the commenter that stated that the funding model should distinguish between the costs of Industry Member data collection and processing and the costs related to SRO surveillance and research,¹⁷⁷³ and to the commenter that recommended that fees be based on suspicious trade messages,¹⁷⁷⁴ the Participants noted that the Bidders cited data ingestion and processing as the primary driver of CAT costs and thus believe that data collection and processing requirements are a reasonable basis for allocating costs to CAT Reporters.¹⁷⁷⁵ As to concerns that a fee based on message traffic would discourage the display of quotes,¹⁷⁷⁶ the Participants explained that “one of the reasons for proposing a tiered, fixed fee funding model

1769

Id.

1770

Id. at 12.

1771

“Participant complexes” refers to Affiliated Participants, which include single entities that hold self-regulatory licenses for multiple exchanges. The Plan defines “Affiliated Participant” as “any Participant controlling, controlled by, or under common control with another Participant.” See CAT NMS Plan, supra note 5, at Section 1.1.

1772

Response Letter II at 12.

1773

SIFMA Letter at 17–18.

1774

Data Boiler Letter at 15.

1775

Response Letter II at 14.

1776

SIFMA Letter at 17.

was to limit the disincentives to providing liquidity to the market,” as might be the case with a strictly variable funding model.¹⁷⁷⁷

The Commission expressed concern in the Notice that the structure of the funding model could provide a competitive advantage to exchanges over ATSS.¹⁷⁷⁸ Under the proposed funding model, for an execution occurring on an exchange, the exchange would pay an Execution Venue fee based on its market share to the CAT. For an execution that occurs on an ATS, the Industry Member operating the ATS would pay an Execution Venue fee based on its market share¹⁷⁷⁹ and the national securities association also would pay an Execution Venue fee based on its market share when the ATS trade is reported to it.¹⁷⁸⁰ In the Notice, the Commission expressed concern that, under the Plan, ATS volume would effectively be charged once to the Industry Member

¹⁷⁷⁷ Response Letter II at 16. As an example, the Participants stated that a firm with a large volume of quotes would likely be categorized by the proposed funding model in an upper fee tier instead of being assessed a fee for its message traffic directly as it would be under “a more directly metered model.”

¹⁷⁷⁸ See Notice, supra note 5, at 30740.

¹⁷⁷⁹ The Commission notes that the Industry Member that operates an ATS also will be subject to message traffic fees. Section 11.3(b) of the CAT NMS Plan states: “The Operating Committee will establish fixed fees to be payable by Industry Members, based on the message traffic generated by such Industry Member. . . . For the avoidance of doubt, the fixed fees payable by Industry Members pursuant to this paragraph shall, in addition to any other applicable message traffic, include message traffic generated by: (i) an ATS that does not execute orders that are sponsored by such Industry Member, and (ii) routing orders to and from any ATS sponsored by such Industry Member.” See CAT NMS Plan, supra note 5, at Section 11.3(b).

¹⁷⁸⁰ Section 11.3(a)(i) of the CAT NMS Plan states: “Each Execution Venue that: (A) executes transactions; or (B) in the case of a national securities association, has trades reported by its members to its trade reporting facility or facilities for reporting transactions effected otherwise than on an exchange, in NMS Stock or OTC Equity Securities will pay a fixed fee depending on the market share of that Execution Venue in NMS Stock and OTC Equity Securities...” Section 11.3(b) applies to Execution Venues transacting in Listed Options, stating: “Each Execution Venue that executes transactions in Listed Options will pay a fixed fee depending on the Listed Options market share of that Execution Venue...” See CAT NMS Plan, supra note 5, at Section 11.3(a)(i)–(ii).

operating the ATS and a second time to FINRA, which would result in ATS volumes contributing twice as much to CAT funding as exchange volumes. The Commission further inquired whether the funding model would disadvantage ATSs relative to registered exchanges, and whether trading volume could migrate to exchanges in response.¹⁷⁸¹

To address this concern, the Participants recommended modifying the proposed funding model to exclude from the charges applicable to a national securities association any market share attributable to transactions reported to it by an ATS.¹⁷⁸²

The Commission finds reasonable the suggested modification to the funding model by the Participants and, accordingly, is amending Section 11.3(a)(i) of the CAT NMS Plan so that the share volume of trades in NMS Stocks or OTC Equity Securities reported by an ATS to a national securities association shall not be included in the calculation of the national securities association's market share for purposes of determining its Execution Venue fee. The Commission believes this amendment helps to mitigate concerns that this aspect of the proposed funding model, by effectively double-counting ATS transactions, would result in an inequitable allocation of fees, unfair discrimination and an unnecessary burden on competition.

¹⁷⁸¹ See Notice, supra note 5, at 30740. The Commission solicited comment on two Commission-proposed alternatives pertaining to fees imposed on ATSs. In the first alternative, the Commission proposed excluding ATS volume from TRF volume. The Commission stated that this alternative would allow SROs that operate TRFs (currently only FINRA) to avoid paying Execution Venue fees for volume originating from an ATS execution and would avoid double-counting ATS volume as share volume. See id. at 30768. The Commission also solicited comment on not charging Industry Members for message traffic to and from their ATSs while still assessing fees to ATSs as Execution Venues or exchange Industry Members for their message traffic. The Commission explained that this alternative would mitigate incentives for Industry Members to route their orders in order to minimize costs under the proposed funding model. Id.

¹⁷⁸² Response Letter II at 13.

With this change, the Commission believes that the funding model set forth in the CAT NMS Plan is reasonable. The Participants have offered a credible justification for using different criteria to charge Execution Venues (market share) and Industry Members (message traffic). The Participants also have offered a reasonable basis for establishing a funding model based on broad tiers, in that it may be easier to implement and less likely to have an incremental deterrent effect on liquidity provision.¹⁷⁸³

In response to concerns that the funding model could make Industry Members subsidize Participant surveillance systems and functions that currently are funded through regulatory fees on Industry Members,¹⁷⁸⁴ the Commission reiterates that the Exchange Act permits the Participants to assess fees among their members to recoup their regulatory costs, as long as such fees meet the applicable Exchange Act standards, including that they be reasonable and equitably allocated,¹⁷⁸⁵ and are not unfairly discriminatory.¹⁷⁸⁶ When such fee proposals are filed with the Commission, they will be published for public comment,¹⁷⁸⁷ and the Commission will have the opportunity to assess the fees.

¹⁷⁸³ Further, the Commission believes that the tiered fee structure effectively mitigates a concern expressed by a commenter that charging for message traffic would amount to a “financial transaction tax” that would negatively impact the financial markets. See Data Boiler Letter at 15.

¹⁷⁸⁴ SIFMA Letter at 17–18.

¹⁷⁸⁵ See 15 U.S.C. 78f(b)(4); 15 U.S.C. 78o-3(b)(5).

¹⁷⁸⁶ See 15 U.S.C. 78f(b)(5); 15 U.S.C. 78o-3(b)(6).

¹⁷⁸⁷ See supra note 1709.

4. Transparency and Alternatives to the Funding Model

Five commenters advocated for greater transparency into CAT funding.¹⁷⁸⁸ One commenter recommended that the CAT’s costs and financing be completely transparent and that the CAT should have “publicly disclosed annual reports, audited financial statements, and executive compensation disclosure.”¹⁷⁸⁹ The commenter also recommended that the Participants engage an independent third party to design the funding model, determine any CAT fees to be charged by Participants,¹⁷⁹⁰ and audit their regulatory revenues and the allocation thereof. It also believed that the Commission should publish the results of the audit.¹⁷⁹¹ Another commenter similarly recommended that the Commission require the Participants to engage an independent third party to review and make recommendations for a transparent and equitable funding model.¹⁷⁹² Another commenter urged transparency in the process of calculating any fees assessed on Participants to make sure they are related to the costs to build, operate, and administer the CAT.¹⁷⁹³ One commenter suggested a greater role in CAT NMS Plan governance for Industry Members and institutional investors to help ensure that the costs and funding of CAT are allocated equitably among Industry Members and SROs.¹⁷⁹⁴

¹⁷⁸⁸ SIFMA Letter; FSI Letter; KCG Letter; Fidelity Letter at 5; DAG Letter. One commenter generally supported additional transparency into the funding model with respect to market share and message traffic. See DAG Letter at 5; see also STA Letter at 1 (supporting the DAG Letter’s cost and funding recommendations).

¹⁷⁸⁹ SIFMA Letter at 29.

¹⁷⁹⁰ Id. at 14.

¹⁷⁹¹ Id.

¹⁷⁹² KCG Letter at 5.

¹⁷⁹³ FSI Letter at 6.

¹⁷⁹⁴ Fidelity Letter at 5.

Two commenters offered alternative funding models.¹⁷⁹⁵ One commenter suggested that CAT fees be set by an independent advisory committee, rather than by the Operating Committee.¹⁷⁹⁶ The other commenter recommended a centralized funding mechanism for the CAT, with the Participants collectively charging Industry Members a single CAT fee instead of each creating their own independent fees, believing it to be the most efficient and consistent way to collect CAT fees.¹⁷⁹⁷ The commenter also suggested that, before the Participants impose any CAT fees on Industry Members, they should provide a public accounting of their current revenues and how that money is spent.¹⁷⁹⁸

Four commenters recommended imposing certain specific fees to fund the CAT.¹⁷⁹⁹ Three of the commenters suggested that the Participants and the Commission pay a user fee for the CAT, since they are direct beneficiaries of the system.¹⁸⁰⁰ Another commenter suggested that the costs of building and maintaining the CAT should be borne by CAT Reporters through a filing or technology fee,¹⁸⁰¹ and recommended charging CAT Reporters with high cancellation rates and those that add “noise” to the CAT system a special usage fee.¹⁸⁰²

¹⁷⁹⁵ Data Boiler Letter; SIFMA Letter.

¹⁷⁹⁶ Data Boiler Letter at 15.

¹⁷⁹⁷ SIFMA Letter at 18.

¹⁷⁹⁸ Id.

¹⁷⁹⁹ SIFMA Letter; Better Markets Letter; FSR Letter; DAG Letter; see also STA Letter at 1 (supporting the DAG Letter’s cost and funding recommendations).

¹⁸⁰⁰ SIFMA Letter at 18, 30 (stating that if Industry Members must pay a user fee to access their own CAT data, then there should be also be a user fee for the Participants); FSR Letter at 10; DAG Letter at 5; see also STA Letter at 1 (supporting the DAG Letter’s cost and funding recommendations).

¹⁸⁰¹ Better Markets Letter at 5.

¹⁸⁰² Id. at 6.

In response, the Participants stated that they did not believe that an independent third party should be hired to evaluate CAT fees, noting that all CAT fees would be filed with the Commission pursuant to the Exchange Act, so that Industry Members and other interested persons would have an opportunity to comment, and the Commission would evaluate whether they are consistent with the statutory standards.¹⁸⁰³ The Participants also noted that the funding model is intended to operate the CAT on a break-even basis, without creating profits for individual Participants.¹⁸⁰⁴ In addition, the Participants stressed that they are prohibited from using regulatory fees for commercial purposes.¹⁸⁰⁵ The Participants concluded that employing an independent third party would be unnecessary in light of these provisions.¹⁸⁰⁶

In response to the commenter that recommended a centralized funding mechanism,¹⁸⁰⁷ the Participants indicated that they intend for fees to be billed and collected centrally through the CAT LLC, so that each Industry Member will receive one invoice instead of separate invoices from each Participant.¹⁸⁰⁸ In response to the suggestion that the Participants charge a regulatory usage fee, the Participants noted that the CAT NMS Plan authorizes the imposition of such a fee, and stated that they plan to evaluate the implementation of usage fees within a year after the Participants begin using the CAT.¹⁸⁰⁹

¹⁸⁰³ Response Letter II at 17.

¹⁸⁰⁴ Id.

¹⁸⁰⁵ Id. at 17 n.60.

¹⁸⁰⁶ Id. at 17.

¹⁸⁰⁷ SIFMA Letter at 15.

¹⁸⁰⁸ Response Letter II at 15.

¹⁸⁰⁹ Id.

The Commission believes that the funding model proposed by the Participants, as amended by the Commission, is consistent with Rule 613(a)(1)(vii)(D) and is reasonable. Rule 613(a)(1)(vii)(D) requires the Participants to discuss in the CAT NMS Plan how they propose to fund the creation, implementation and maintenance of the CAT, including the proposed allocation of estimated costs among the Participants, and between the Participants and Industry Members.¹⁸¹⁰ In the CAT NMS Plan, the Participants set forth a funding model that establishes a framework for the allocation of CAT costs across Participants and Industry Members. At this time, the Commission believes that the Exchange Act rule filing process, described above, will provide sufficient transparency into the fees charged by the Participants that are associated with CAT.¹⁸¹¹

With respect to the suggested imposition of a regulatory user fee,¹⁸¹² a fee for high cancellation rates and “noise,”¹⁸¹³ or a specific technology fee,¹⁸¹⁴ the Commission notes that nothing in the Plan prohibits such fees from being charged and, if the Participants determine such fees to be appropriate, they may file a proposed rule change that would be subject to public comment and Commission review.¹⁸¹⁵

¹⁸¹⁰ See 17 CFR 242.613(a)(1)(vii)(D).

¹⁸¹¹ See 17 CFR 240.19b-4(f)(2); see also 15 U.S.C. 78s(b)(3)(A); 17 CFR 242.608; supra note 1756.

¹⁸¹² SIFMA Letter at 18; FSR Letter at 10, DAG Letter at 5; see also STA Letter at 1 (supporting the DAG Letter’s cost and funding recommendations).

¹⁸¹³ Better Markets Letter at 6.

¹⁸¹⁴ Id. at 5.

¹⁸¹⁵ See Section V.F.3.b, infra, for additional discussion of these comments. As it relates to fees that the Operating Committee may impose for access to and use of the CAT for regulatory and oversight purposes, the Commission interprets the provisions in the Plan

5. Miscellaneous

The Commission notes that it is amending Section 11.1(d) of the CAT NMS Plan, which currently states that the Operating Committee shall adopt policies, procedures, and practices regarding, among other matters, the assignment of fee tiers, and that, as part of its regular review of fees for the CAT, the Operating Committee shall have the right to change the tier assigned to any particular Person in accordance with Article XI, and such changes will be effective upon reasonable notice to such Person. The Commission is amending this section to provide that the Operating Committee shall have the right to change the tier assigned to any particular Person in accordance with fee schedules previously filed with the Commission by the Operating Committee that are reasonable, equitable and not unfairly discriminatory and subject to notice and comment. The Commission believes this amendment to Section 11.1(d) is appropriate because it limits the discretion of the Operating Committee to change the tier assigned to a particular Person to objective standards previously filed with the Commission that are consistent with Exchange Act standards, and provides notice of any changes to the objective standards and the opportunity for public comment.

G. Dispute Resolution

As noted above, the Plan does not include a general provision addressing the method by which disputes arising in connection with the operation of the Plan will be resolved.¹⁸¹⁶ The Plan does, however, provide the means for resolving disputes regarding the Participation Fee in

relating to the collection of fees as applying only to Participants and Industry Members, and thus the Commission would not be subject to such fees.

¹⁸¹⁶ See Notice, supra note 5, at 30635.

Articles III and XI of the Plan.¹⁸¹⁷ The Commission did not receive any comments regarding these general dispute resolution provisions. However, the Commission is amending Article III to make it consistent with Article XI.

Specifically, Article III, Section 3.3(b) of the Plan states that, in the event that the Company and a prospective Participant do not agree on the amount of the Participation Fee, such amount will be subject to the review by the Commission. The Plan currently cites to Section 11A(b)(5) of the Exchange Act¹⁸¹⁸ as the authority by which the Commission can review such disputes. However, Section 11A(b)(5) of the Exchange Act is not the appropriate authority for Commission review under these circumstances because the CAT is not a “registered securities information processor.” Accordingly, the Commission is making a technical amendment to the Plan (consistent with Article XI, Section 11.5) to provide that in the event that the Company and a prospective Participant do not agree on the amount of the Participation Fee, such amount will be subject to review by the Commission pursuant to SEC Rule 608¹⁸¹⁹ or in any other appropriate forum.

H. Written Assessments, Audits and Reports

Section 6.6 of the Plan as filed, pursuant to Rule 613(b)(6), requires the Participants to provide the Commission with a written assessment of the operation of the CAT at least every two

¹⁸¹⁷ CAT NMS Plan, supra note 5, at Section 3.3.

¹⁸¹⁸ See id. at Section 3.3(b); see also, Exchange Act Section 11A(b)(5), 15 U.S.C. 78k-1(b)(5) (which provides that a prohibition or limitation on access to services by a registered securities information processor must be reviewed by the Commission upon application by an aggrieved person).

¹⁸¹⁹ 17 CFR 242.608(d).

years or more frequently in connection with any review of the Plan Processor's performance.¹⁸²⁰

The Plan requires that such written assessment include, at a minimum: (i) an evaluation of the Plan Processor's performance; (ii) a detailed plan for any potential improvements to its performance; (iii) an estimate of the costs associated with any such potential improvements; and (iv) an estimated implementation timeline for any such potential improvements.¹⁸²¹

The Commission believes that it is important that the CAT keep pace with technological developments and changes to industry business practices, which can occur very rapidly. As such, the Commission believes that assessments more frequent than biannually of the CAT's standards and processes could ensure that the Plan Processor and the Participants remain current in their knowledge of technological and business developments and facilitate enhancements to the CAT as appropriate. The Commission believes that the preparation of reports and assessments on an annual basis, rather than a biannual basis, will help ensure that CAT technology and operations continue to provide timely, accurate, complete and accessible data, and that it is collected in a cost-effective manner. Accordingly, the Commission is amending Section 6.6 of the Plan to change the frequency of the assessment contemplated by Rule 613(b)(6) from biannual to annual.

The Commission is also amending Section 6.6 of the Plan to provide further detail regarding elements of the written assessment to be conducted by the Participants. Specifically, as amended, the Participants' annual written assessment must also include: (1) an evaluation of the information security program of the CAT to ensure that the program is consistent with the

¹⁸²⁰ See CAT NMS Plan, supra note 5, at Section 6.6.

¹⁸²¹ Id.

highest industry standards for protection of data;¹⁸²² (2) an evaluation of potential technological upgrades based upon a review of technological developments over the preceding year, drawing on necessary technological expertise, whether internal or external;¹⁸²³ (3) an assessment of efforts to reduce the time to restore and recover CAT Data at a back-up site;¹⁸²⁴ (4) an assessment of how the Plan Processor and SROs are monitoring Error Rates and addresses the application of Error Rates based on product, data element or other criteria;¹⁸²⁵ (5) a copy of the evaluation required by Section 6.8(c) of the Plan as to whether industry standards have evolved such that: (i) the clock synchronization standard in Section 6.8(a) should be shortened; or (ii) the required timestamp in Section 6.8(b) should be in finer increments; and (6) an assessment of whether any data elements should be added, deleted or changed.¹⁸²⁶ The Commission believes that requiring these specific issues to be addressed in the Participants' annual assessment will focus the Plan Processor and Participants on critical technological and other developments, and should help ensure that CAT technology is up-to-date, resilient and secure, and provides accurate CAT Data.

Section 6.6 of the Plan as filed also requires the Participants to provide an estimate of the costs associated with any potential improvements to the performance of the CAT, including an assessment of the potential impact on competition, efficiency and capital formation. The Commission believes, however, that it is important that the Participants consider not just the

¹⁸²² See Section IV.D.6.a, supra.

¹⁸²³ See Section IV.D.14, supra.

¹⁸²⁴ See Section IV.D.12, supra.

¹⁸²⁵ See Section IV.D.11, supra.

¹⁸²⁶ See Section IV.D.13, supra.

costs but also the potential benefits associated with any improvements to the performance of the CAT, including the impact on investor protection. Accordingly, the Commission is also amending Section 6.6 of the Plan to require the annual assessment to consider the benefits of potential improvements to the CAT, including to investor protection.

The Commission is further amending Section 6.6 of the Plan to require that the Participants provide the Commission with certain written reports on a one-time basis. First, the Participants must provide the Commission, and make public, at least one month prior to submitting any rule filing to establish initial fees for CAT Reporters, an independent audit of the fees, costs, and expenses incurred by the Participants on behalf of the Company prior to the Effective Date of the Plan.¹⁸²⁷ The Commission notes that any such filing will be published for public notice and comment. As the Commission understands that the Participants intend to recover through CAT fees the amounts spent on the development of the CAT to date, to facilitate public comment and Commission review of such fee filings,¹⁸²⁸ the Commission believes it is appropriate for the Participants to obtain an audit of the fees, costs and expenses incurred by the Participants on behalf of the Company prior to the Effective Date.

Second, the Commission is amending the Plan to require the Participants to provide the Commission with a written assessment of the clock synchronization standards in the Plan¹⁸²⁹ within six months of effectiveness of the Plan. As noted above, the Commission believes that the Participants should consider the type of CAT Reporter, the type of Industry Member, and type of system when determining industry standards, and is amending the Plan to clarify this

¹⁸²⁷ See Section III.6., supra.

¹⁸²⁸ See supra note 1709.

¹⁸²⁹ See Section IV.D.13, supra.

more granular approach. The Commission believes the Participants should consider the Plan's clock synchronization standards in light of this clarification promptly, and propose any appropriate amendments, and that a six-month timeframe to do so is reasonable.

Third, the Commission is amending the Plan to require the Participants to provide the Commission with a written report that discusses the Participants' assessment of implementing coordinated surveillance, whether through 17d-2 agreements, RSAs, or some other approach, within 12 months of effectiveness of the Plan.¹⁸³⁰ The Commission notes that the CAT is designed to facilitate the ability of regulators to conduct cross-market surveillances and to review conduct that occurs across the market. As a result, the Commission believes that it may be efficient for the Participants to coordinate to conduct cross-market surveillances.

Fourth, the Commission is amending the Plan to require the Participants to submit to the Commission a written report, within 24 months of effectiveness of the Plan, discussing the feasibility, benefits, and risks of allowing an Industry Member to bulk download the Raw Data that it has submitted to the Central Repository.¹⁸³¹ Commenters expressed a desire to have bulk access to their own data for surveillance and internal compliance purposes, as well as to facilitate the error correction process. While, the Participants did not permit such access in the Plan, citing security and cost concerns, they did represent that they would consider allowing bulk access to the audit trail data reported by Industry Members once CAT is operational. The Commission believes it is important to consider the potential efficiencies of allowing Industry Members bulk access to their own CAT data, so long as such access does not impact the security of the CAT

¹⁸³⁰ See Section IV.B.4., *supra*. This assessment can be provided in conjunction with an annual written assessment required by Rule 6.6 of the Plan.

¹⁸³¹ See Section IV.D.6.m, *supra*. This report may be provided in conjunction with an annual written assessment required by Rule 6.6 of the Plan.

Data, and accordingly believes that requiring a report discussing this issue by the date Industry Members first begin reporting to the CAT, is appropriate.

Fifth, the Commission is amending the Plan to require the Participants to provide the Commission with a written assessment, within 36 months of effectiveness of the Plan, of the nature and extent of errors in the Customer information submitted to the Central Repository and whether the correction of certain data fields over others should be prioritized.¹⁸³² The Commission believes that requiring such an assessment, which will coincide with the date all Industry Members are reporting to the CAT, could help ensure that the accuracy of CAT Data is achieved in the most prompt and efficient manner.

Sixth, the Commission is amending the Plan to require the Participants to provide the Commission with a written report, 36 months after effectiveness of the Plan, on the impact of tiered fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity.¹⁸³³ One commenter expressed concern that use of a tiered fee structure could discourage displayed quotes and, in response, the Participants explained that one of the reasons they chose to use a tiered-fee funding model was to limit disincentives to provide liquidity. To help determine whether the Plan's funding model actually achieves the Participants' stated objective, the Commission believes it appropriate to require them to prepare such an assessment of the impact of tiered fees once the CAT becomes fully operational.

¹⁸³² See Section IV.D.4.a, supra. This assessment may be provided in conjunction with an annual written assessment required by Rule 6.6 of the Plan.

¹⁸³³ See Section IV.F.3., supra.

Finally, the Commission is amending the Plan to require the Participants to provide the Commission a written assessment of the projected impact of any Material Systems Change on the Maximum Error Rate, prior to the implementation of any Material Systems Change.¹⁸³⁴ The Commission believes that Material Systems Changes either could result in new challenges for CAT Reporters or simplify the means for reporting data. In either case, the appropriateness of the Maximum Error Rate could be impacted, and thus warrant a change. Accordingly, the Commission believes it appropriate to require the Participants to provide the Commission an assessment of the projected impact on the Maximum Error Rate, including any recommended changes thereto, prior to the implementation of any Material Systems Change.

V. Economic Analysis

A. Introduction

The Commission is sensitive to the economic effects of the CAT NMS Plan,¹⁸³⁵ including its costs and benefits and its impact on efficiency, competition and capital formation. In accordance with the approach articulated by the Commission in the Adopting Release, the Commission published its preliminary economic analysis of the CAT NMS Plan in the Notice, and solicited comment on its analysis and on all aspects of the proposed Plan. The Commission has considered the comments received, along with the Participants' responses, and has modified certain aspects of the Plan, as discussed above.

This Section reflects the Commission's analysis and conclusions regarding the economic effects of the creation, implementation and maintenance of the CAT pursuant to the details in the CAT NMS Plan, as amended and hereby approved by the Commission. The analysis is divided

¹⁸³⁴ See Section IV.D.11.b., supra.

¹⁸³⁵ See CAT NMS Plan, supra note 5.

into seven topics: (1) a summary of the expected economic effects of approving the CAT NMS Plan; (2) a description of the economic framework for analyzing the economic effects of approving the CAT NMS Plan; (3) a discussion of the current, or “Baseline,” audit trail data available to regulators, and the sources of such data; (4) a discussion of the potential benefits of approving the CAT NMS Plan; (5) a discussion of the potential costs of approving the CAT NMS Plan; (6) a discussion of the CAT NMS Plan’s potential impact on efficiency, competition, and capital formation; and (7) a discussion of alternatives to various features of the CAT NMS Plan and to the CAT NMS Plan itself.

B. Summary of Expected Economic Effects

The Commission has analyzed the expected economic effects of the CAT NMS Plan in light of the existing shortcomings in the regulatory data infrastructure and the goal of improving the ability of SROs and the Commission to perform their regulatory activities to the benefit of investors and the markets.¹⁸³⁶ In general, the Commission believes that the CAT NMS Plan will result in benefits by improving the quality of the data available to regulators in four areas that affect the ultimate effectiveness of core regulatory efforts—completeness, accuracy, accessibility and timeliness.¹⁸³⁷ The Commission believes that the improvements in these data qualities that will be realized from approval of the CAT NMS Plan will substantially improve regulators’ ability to perform analysis and reconstruction of market events, market analysis and research to

¹⁸³⁶ The Commission noted current SRO audit trail limitations in the Proposing Release and the Adopting Release. See Proposing Release, supra note 14, at 32563–68; Adopting Release, supra note 14, at 45726–30. Rule 613 is designed to address these limitations.

¹⁸³⁷ See Adopting Release, supra note 14, at 45727 (discussing four “qualities” of trade and order data that impact the effectiveness of core SRO and Commission regulatory efforts: accuracy, completeness, accessibility, and timeliness); see also Section V.E. infra, for a detailed discussion of the expected benefits of the CAT NMS Plan.

inform policy decisions, and other regulatory activities including market surveillance, examinations, investigations, and other enforcement functions. Regulators depend on data for many of these activities and the improvements in the data qualities will thus improve the efficiency and effectiveness of such regulatory activities. As explained further below, these improvements could benefit investors by giving regulators more and better regulatory tools to provide investors with a more effectively regulated trading environment,¹⁸³⁸ which could increase capital formation, liquidity, and price efficiency. Data improvements could enhance regulators' ability to provide investors and the public with more timely and accurate analysis and reconstruction of market events, and to develop more effective responses to such events. Improved understanding of emerging market issues resulting from enhanced market analysis and research could inform regulatory policies that improve investor protection through better market quality, more transparency, and more efficient prices. Improvements in quality and quantity of order events could lead to improvements in developing and targeting policy approaches to ensure a fair and orderly market.

In terms of completeness, the Plan requires the reporting of certain additional data fields, events, and products.¹⁸³⁹ More importantly, the CAT NMS Plan requires data elements useful for regulatory analysis to be available from a single data source. Having relevant data elements available from a single source will simplify and expedite regulators' data collection process and facilitate more efficient analyses and surveillances that incorporate cross-market and cross-product data.

¹⁸³⁸ See Section V.E.2, *infra*.

¹⁸³⁹ See CAT NMS Plan, *supra* note 5, at Sections 6.3, 6.4; *see also* 17 CFR 242.613(c)(7).

With respect to the accuracy of available data, the Commission believes that the requirements in the Plan will improve data accuracy significantly. For example, the Commission expects that the requirements to store the CAT Data in a uniform linked format and the use of consistent identifiers for customers and market participants will result in fewer inaccuracies as compared to current data sources. These accuracy improvements should significantly reduce the time regulators spend processing the data and finding solutions when faced with inaccurate data. The Commission believes that the requirements in the Plan for clock synchronization and timestamp granularity will improve the accuracy of data with respect to the timing of market events. The Commission believes that the Plan will improve regulators' ability to determine the sequence of some market events relative to all surrounding events.¹⁸⁴⁰

The Commission also believes that the Plan will increase the accessibility of data for SROs and the Commission, because regulators will be able to access the CAT Data directly.¹⁸⁴¹ This, coupled with the improvements in completeness, will vastly increase the scope of

¹⁸⁴⁰ The CAT NMS Plan requires that CAT Reporters who are Industry Members synchronize their business clocks to within 50 milliseconds of the time maintained by the NIST, which will increase the precision of the timestamps provided by the 39% of broker-dealers who currently synchronize their clocks with less precision than what is called for by the Plan. See FIF Clock Offset Survey, supra note 247. Further, the Commission has amended the Plan to require exchanges to synchronize their business clocks to within 100 microseconds. While this is similar to current practice, this requirement should still provide the greater ability for regulators to sequence unrelated events in a market reconstruction by anchoring lifecycles to events at exchanges. Independent of the potential time clock synchronization benefits, the order linking data that will be captured in CAT should increase the proportion of events that could be sequenced accurately. This reflects the fact that some records pertaining to the same order could be sequenced by their placement in an order lifecycle (e.g., an order submission must have occurred before its execution) without relying on timestamps. This information may also be used to partially sequence surrounding events, particularly with the Plan modifications.

¹⁸⁴¹ See CAT NMS Plan, supra note 5, at Appendix C, Section A.2, Appendix D, Section 8.1; see also 17 CFR 242.613(e)(2).

information readily available to regulators and significantly reduce the number of data requests from the several hundred thousand requests regulators make each year. The increased scope of readily available information should facilitate more data-driven regulatory policy decisions, broaden the potential surveillances, expand the opportunities for SRO and Commission analysis to help target broker-dealers and investment advisers for examinations and help to perform those examinations.

Finally, the Commission believes that the CAT NMS Plan will improve the timeliness of available data. Because regulators will be able to access uncorrected data the day after an order event and will be able to access corrected and linked data five days after an order event,¹⁸⁴² many data elements will be available to regulators more quickly than they are currently. Accordingly, the amount of time regulators would need to acquire and process data before running analyses would be reduced. For example, the corrected and linked data available on T+5 will identify the customer account associated with all order events, information that currently takes ten days or longer for regulators to obtain and then need to link to other data sources for use. These improvements in timeliness, combined with improvements in completeness, accessibility, and accuracy discussed above, will improve the efficiency of regulatory analysis and reconstruction of market events, as well as market analysis and research that informs policy decisions, and make market surveillance, examinations, investigations, and other enforcement functions more

¹⁸⁴² CAT Data will be reported by 8:00 a.m. ET on T+1 and made available to regulators in raw form after it is received and passes basic formatting validations with an error correction process completed by 8:00 a.m. ET on T+5. While the Plan does not specify exactly when these validations would be complete, the requirement to link records by 12:00 p.m. ET on T+1 gives a practical upper bound on this timeline. See CAT NMS Plan, supra note 5, at Appendix C, Sections A.2(a), A.3(a), Appendix D, Section 6.2.

efficient, allowing, for example, the SROs and the Commission to review tips and complaints more effectively.

The Commission notes that the Plan lacks information regarding the details of certain elements of the Plan likely to affect the costs and benefits associated with it, primarily because those details have not yet been determined, and this lack of information creates some uncertainty about the expected economic effects. As discussed further below, lack of specificity surrounding the processes for converting data formats and linking related order events creates uncertainty as to the anticipated improvements in accuracy because such processes have the potential to create new data inaccuracies. Lack of specificity surrounding the process for regulators to access the CAT Data also creates uncertainty around the expected improvements in accessibility. For example, while the Plan indicates that regulators would have an online targeted query tool and a tool for user-defined direct queries or bulk extraction,¹⁸⁴³ the Plan itself does not provide an indication for how user-friendly the tools would be or the particular skill set needed to use the tools for user-defined direct queries. However, the Commission has analyzed the expected economic effects of the Plan to the extent possible with the information available, noting areas of uncertainty in its analysis where applicable. The Commission has also considered whether certain provisions related to the operation and administration of the Plan could mitigate some of the uncertainties.¹⁸⁴⁴

The Commission also believes that more effective and efficient regulation of securities markets and market participants resulting from implementation of the CAT NMS Plan could significantly benefit investors and the integrity of the market. For example, the Commission

¹⁸⁴³ Id. at Appendix D, Sections 8.1.1, 8.1.2.

¹⁸⁴⁴ See Section V.E.3.d, infra.

believes that more effective and efficient surveillance and enforcement should detect a higher proportion of violative market activity. This additional detection could not only reduce violative behavior through potential enforcement actions, but through deterrence if market participants believe violative activities are more likely to be detected. Because violative activity degrades market quality and imposes costs on investors and market participants, reductions in violative activity would benefit investors and market integrity. Likewise, more effective and efficient risk assessment and risk-based examinations should facilitate the selection of market participants for examination who have characteristics that elevate their risk of violating the rules. Decreasing the amount of violative activity by targeting exams in this way should provide investors with a more effectively regulated trading environment and hence better market quality. Further, access to audit trail data that is comprehensive, accurate, and timely should improve regulatory reconstruction of market events, market analysis, and research, resulting in an improved understanding of emerging market issues and regulatory policies that better encourage industry competition, thus improving investor protection through better transparency and more efficient prices.¹⁸⁴⁵ Regulatory initiatives that are based on a more thorough understanding of underlying events and their causes, and that are narrowly tailored to address any market deficiency, should improve market quality and benefit investors. Access to more complete and linked audit trail data will improve regulators' ability to analyze and reconstruct market events, allowing regulators to provide investors and the public with more accurate explanations of market events, to develop more effective responses to such events, and to use the information to assist in retrospective analyses of their rules and pilots.

¹⁸⁴⁵ See Section V.E.2, *infra*.

The Commission has also evaluated the potential costs that will result from the approval of the CAT NMS Plan. The Commission's cost analysis is based on the preliminary analysis in the Notice, which analyzed information included in the Plan, information gathered from market participants through discussions, surveys of market participants, and other relevant information to estimate the potential costs associated with building and maintaining the Central Repository as well as the costs to report data to the Central Repository. The Commission has considered the comments received on its preliminary analysis, the Participants' response to the comments, and the impact of the Commission's modifications to the Plan and has revised its analysis and estimates accordingly.¹⁸⁴⁶ Currently, the 21 Participants spend \$170.3 million annually on reporting regulatory data and performing surveillance, while the approximately 1,800 broker-dealers anticipated to have CAT reporting responsibilities spend \$1.6 billion annually on regulatory data reporting, for total current industry costs of \$1.7 billion annually for regulatory data reporting and surveillance by SROs. Having considered the comments, the Participants' response and the Commission's modifications to the Plan, the Commission now estimates the cost of the Plan as approximately \$2.4 billion in initial aggregate implementation costs and recurring annual costs of \$1.7 billion.¹⁸⁴⁷ Furthermore, the Commission acknowledges that during the period of duplicative reporting, during which CAT Reporters will report to both current regulatory data reporting systems and CAT, industry will face duplicative reporting costs that the Commission estimates at \$1.7 billion per year, the cost of industry's current data reporting.

¹⁸⁴⁶ See Section V.F.1 and Section V.F.2, infra for discussion of comments received on cost estimates, and revisions the Commission made to those estimates in response.

¹⁸⁴⁷ See Section V.F.2, infra.

Commenters had numerous comments on individual estimates of costs, particularly as they related to requirements to report allocation timestamps in milliseconds, the costs of duplicative reporting, and generally about the uncertainty surrounding cost estimates. The primary driver of the annual costs is the data reporting cost for broker-dealers, which is estimated to be \$1.5 billion per year. For both large and small broker-dealers, the primary driver of both the current \$1.6 billion reporting costs and projected \$1.5 billion CAT reporting costs is costs associated with staffing. Bidder estimates of the costs to build the Central Repository vary from \$37.5 million to \$65 million and annual operating costs range from \$36.5 to \$55 million. The eventual magnitude of Central Repository costs depends on the Participants' selection of the Plan Processor, and may ultimately differ from estimates discussed above if Bids are revised as the bidding process progresses. Furthermore, the Plan anticipates a period of duplicative reporting responsibilities preceding the retirement of potentially duplicative regulatory data reporting systems; these duplicative reporting costs are likely to be significant.¹⁸⁴⁸

Drawing from the discussion in the CAT NMS Plan, the comments received, and the Participants' response to the comments,¹⁸⁴⁹ the Commission expects that the Plan will have a number of additional economic effects, including effects on efficiency, competition, and capital formation. The Commission believes that the Plan generally promotes competition. However, the Commission recognizes that the Plan could increase barriers to entry because of the costs to comply with the Plan. Further, the Commission's analysis identifies several limiting factors to competition; however, Plan provisions and Commission oversight could mitigate such limiting

¹⁸⁴⁸ The economic analysis discusses duplicative reporting costs in Section V.F.2, infra.

¹⁸⁴⁹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.8; see also Section V.G, infra.

factors. The Commission believes that the Plan will result in significant improvements in efficiency related to how regulatory data is collected and used. Specifically, the approval of the Plan will result in improved data becoming available to regulators, which will increase the efficiency of regulatory activities such as market surveillance, examinations, investigations, and other enforcement functions that could enhance market efficiency by reducing violative activity that harms market efficiency. In addition, the availability of this data should improve regulatory analysis and reconstruction of market events, as well as market analysis and research that informs policy decisions. Finally, the Commission believes that the Plan could have positive effects on capital formation and allocative efficiency and that the threat of a security breach at the Central Repository is unlikely to significantly harm capital formation. The Commission recognizes that the Plan's likely effects on competition, efficiency and capital formation are dependent to some extent on the performance and decisions of the Plan Processor and the Operating Committee in implementing the Plan, and thus there is necessarily some uncertainty in the Commission's analysis. Nonetheless, the Commission believes that the Plan contains certain governance provisions, as well as provisions relating to the selection and removal of the Plan Processor, that mitigate this uncertainty by promoting decision-making that could, on balance, have positive effects on competition, efficiency, and capital formation.

As part of its economic analysis, the Commission has also considered the likely economic effects of a number of alternatives to the approaches taken in the CAT NMS Plan. The Commission has analyzed certain alternatives that could have a direct and significant impact on costs or benefits deriving from at least one of the four data qualities discussed above: accuracy, completeness, accessibility, and timeliness. This analysis includes alternatives proposed by commenters.

C. Framework for Economic Analysis

As discussed above, the Commission has conducted an economic analysis of the CAT NMS Plan, including the modifications made by the Commission, as anticipated in the Adopting Release for Rule 613.¹⁸⁵⁰ In particular, the Commission has carefully evaluated the information in the CAT NMS Plan, including the twelve considerations required by Rule 613¹⁸⁵¹ and the details of the decisions left to the discretion of the SROs. The Commission has also considered information drawn from outside the Plan, but that was included in its preliminary economic analysis in the Notice and subject to public comment,¹⁸⁵² in order to assess potential economic effects not addressed therein. Finally, the Commission considered comments submitted in response to its Notice. To provide context for this analysis, this Section describes the economic framework for the analysis and seeks to identify uncertainties within that framework.

The framework for the Commission's final economic analysis is largely the same as the framework set out in the economic analysis of the Notice,¹⁸⁵³ though the Commission has revised its discussion of uncertainty to recognize comments.¹⁸⁵⁴ This Section includes a high-level summary of those comments, which are addressed in the economic analysis to follow.

1. Economic Framework

a. Benefits

The CAT NMS Plan will create a new data source that should modernize and eventually

¹⁸⁵⁰ See Adopting Release, supra note 14, at 45789.

¹⁸⁵¹ 17 CFR 242.613(a)(1).

¹⁸⁵² See Notice, supra note 5, at 30651–30797.

¹⁸⁵³ Id. at 30654–30656.

¹⁸⁵⁴ See Data Boiler Letter at 9, 30; SIFMA Letter at 6, 13, 15–16, 23–24, 32, 39, 40, 42, 44–45; FSR Letter at 9–10; Fidelity Letter at 6; TR Letter at 4; FSI Letter at 5–6; DAG Letter at 5; UnaVista Letter at 2.

replace the use of some disparate current data sources for many regulatory activities. As such, the economic benefits of the CAT NMS Plan will come from any expanded and more efficient regulatory activities facilitated by improvements to the data regulators use. Therefore, the framework for examining benefits in this economic analysis involves first considering whether and to what degree the CAT Data will improve on the Baseline of current trading and order data in terms of the four qualities of accuracy, completeness, accessibility, and timeliness.¹⁸⁵⁵

Through these improvements in the data, the economic analysis then considers the degree to which the Plan will result in improvements to regulatory activities such as the analysis and reconstruction of market events, in addition to market analysis and research conducted by SROs and Commission Staff, as well as market surveillance, examinations, investigations, and other enforcement functions. These potential improvements, based on the regulatory objectives of the CAT NMS Plan described in the Adopting Release,¹⁸⁵⁶ relate to the overall goal of substantially enhancing the ability of the SROs and the Commission to oversee securities markets and fulfill their regulatory responsibilities under the securities laws. The economic framework explores how the improvements to these regulatory activities provide economic benefits to investors and the market. Among other things, potential benefits that could result from the CAT NMS Plan include benefits rooted in changes in the behavior of market participants. For example, requirements to report certain data elements or events to the CAT could have the beneficial effect of detecting and deterring rule violations because the inclusion of certain data fields and improvements in the ability to surveil for violations could increase the perceived costs of violating rules and regulations. Potential benefits could also stem from improved investor

¹⁸⁵⁵ See Adopting Release, supra note 14, at 45727.

¹⁸⁵⁶ Id. at 45730.

protection, such as from more effective surveillance and more informed, data-driven rulemaking. In addition, potential benefits could stem from future reduced costs due to more targeted, data-driven policy choices.

(1) Data Qualities

In assessing the potential benefits of the CAT NMS Plan, the Commission's economic analysis compares the data that will be available under the Plan to the trading and order data currently available to regulators to determine whether and to what degree the Plan will improve the available data with respect to the four qualities of accuracy, completeness, accessibility, and timeliness.¹⁸⁵⁷

(2) Regulatory Activities

Any economic benefits will derive from how such improved data will affect regulatory activities. Therefore, to analyze the potential benefits of the CAT NMS Plan, the economic analysis also evaluates the potential of the CAT NMS Plan to meet the regulatory objectives set out in the Adopting Release for Rule 613. The objectives are: improvements in the analysis and reconstruction of broad-based market events; improvements in market analysis in support of regulatory decisions; and improvements in market surveillance, investigations, and other

¹⁸⁵⁷ Id. at 45727. Accuracy refers to whether the data about a particular order or trade is correct and reliable. Completeness refers to whether a data source represents all market activity of interest to regulators, and whether the data is sufficiently detailed to provide the information regulators require. While current data sources provide the trade and order data required by existing rules and regulations, those sources generally do not provide all of the information of interest to regulators in one consolidated audit trail. Accessibility refers to how the data is stored, how practical it is to assemble, aggregate, and process the data, and whether all appropriate regulators could acquire the data they need. Timeliness refers to when the data is available to regulators and how long it would take to process before it could be used for regulatory analysis. As explained in the Baseline, Section V.D.2, infra, the trading and order data currently available to regulators suffers from deficiencies in all four dimensions.

enforcement activities.¹⁸⁵⁸

A. Analysis and Reconstruction of Broad-based Market Events

The economic analysis considers whether and to what extent the CAT NMS Plan will facilitate regulators' performance of analysis and reconstruction of market events, potentially helping to better inform both regulators and investors about such market events and speeding the regulatory response following market events. Regulators perform reconstructions of market events so that they and the public can be informed by an accurate accounting of what happened (and, possibly, why it happened). As discussed in the Benefits Section,¹⁸⁵⁹ market reconstructions currently can take a significant amount of time, in large measure due to various deficiencies in the currently available trading and order data.¹⁸⁶⁰ The sooner regulators complete a reconstruction and analysis of a market event, the sooner investors can be informed and the sooner regulators can begin reviewing the event to determine what happened, who was affected and how, and whether the analysis supports potential regulatory responses.¹⁸⁶¹ In addition, the improved ability for regulators to generate prompt and complete market reconstructions could provide improved market knowledge, which could assist regulators in conducting retrospective analysis of their rules and pilots.

B. Market Analysis in Support of Regulatory Decisions

The economic analysis considers whether and to what extent the CAT NMS Plan will

¹⁸⁵⁸ See Adopting Release, supra note 14, at 45730.

¹⁸⁵⁹ See Section V.E.2.a, infra.

¹⁸⁶⁰ See Section V.D.2.b, infra.

¹⁸⁶¹ See Adopting Release, supra note 14, at 45732.

enhance the ability of the SROs and the Commission to conduct market analysis and research, including analysis of market structure, and the degree to which it will improve regulators' market knowledge and facilitate consideration of policy questions of interest. The SROs and Commission Staff conduct data-driven analysis on market structure, in direct support of both rulemaking and other regulatory decisions such as SRO rule approvals. The Commission also relies on such analysis to improve understanding of market structure in ways that could inform policy. Finally, SROs conduct market analysis and research on their own regulatory initiatives. Improvements in the ability to conduct market analysis could further improve analysis related to regulatory decisions and potentially influence those regulatory decisions to the benefit of investors and the markets more generally.

C. Market Surveillance and Investigations

The economic analysis examines whether the CAT NMS Plan will improve market surveillance and investigations, potentially resulting in more effective oversight of trading, better investor protection, and deterrence of violative behavior. As described in more detail in the Baseline Section,¹⁸⁶² both SROs and the Commission conduct market surveillance, examinations, investigations, and other enforcement functions targeting illegal activities such as insider trading, wash sales, or manipulative practices. Improvements in market surveillance and investigations could come in the form of “facilitating risk-based examinations, allowing more accurate and faster surveillance for manipulation, improving the process for evaluating tips,

¹⁸⁶² See Section V.D.1.c.(1) and Section V.D.1.c.(3), *infra*.

complaints, and referrals . . . , and promoting innovation in cross-market and principal order surveillance.”¹⁸⁶³

b. Costs

The economic analysis evaluates the costs of building and operating the Central Repository; the costs of CAT reporting for Participants, broker-dealers, and service bureaus; and other CAT-related costs. Where the CAT NMS Plan provides estimates of these costs, the economic analysis evaluates those estimates and re-estimates them when necessary. The economic analysis also discusses the drivers of these costs, and whether broker-dealers may or may not pass these costs down to their customers. As a part of its consideration of the costs of the CAT NMS Plan, the economic analysis considers costs from duplicative reporting for some period of time as well as potential cost savings from the retirement of duplicative regulatory reporting systems.¹⁸⁶⁴

The economic analysis also considers whether the CAT NMS Plan could result in second order effects, such as changes to the behavior of market participants, that impose certain costs. For example, the CAT NMS Plan’s tiered funding model could lead to efforts by market participants to try to control their tiers in order to affect their fee payments, such as reducing activity levels near the end of an activity level measuring period to avoid being classified as a higher activity level firm. In addition, Participants, their members, and investors could incur costs if their private information were accessed in the event of a security breach of the Central

¹⁸⁶³ See Adopting Release, supra note 14, at 45730.

¹⁸⁶⁴ Rule 613 requires the Plan to discuss “[a] plan to eliminate existing rules and systems (or components thereof) that would be rendered duplicative by the consolidated audit trail.” 17 CFR 242.613(a)(1)(ix); see also CAT NMS Plan, supra note 5, at Appendix C Section C.9.

Repository. The economic analysis considers these and other elements of the Plan that could lead to distortions in behavior by market participants.

2. Existing Uncertainties

In the Notice, the Commission described how it analyzed the information in the CAT NMS Plan, as well as other relevant data,¹⁸⁶⁵ in order to assess the economic effects of the Plan. As discussed throughout the analysis in the Notice, in certain cases the Commission lacked information needed to evaluate all of the potential economic effects of the CAT NMS Plan, creating uncertainty in some potential benefits and costs. The primary drivers of uncertainty included the fee schedule applicable to funding the Central Repository (the “Funding Model”), which has not yet been finalized, the deferral of decisions on certain discretionary elements including the Technical Specifications applicable to the CAT, and a lack of detailed information that would enable the Commission to assess certain economic effects with greater precision.¹⁸⁶⁶ The Notice discussed implications of each primary area of uncertainty.¹⁸⁶⁷

First, the economic analysis in the Notice evaluated information provided in the CAT NMS Plan on the economic effects of the Plan, as well as information drawn from outside of the Plan. However, the Commission lacked detailed information regarding some of the individual

¹⁸⁶⁵ In addition to the CAT NMS Plan, the economic analysis in the Notice analyzed, for example, the Exemptive Relief Letter (see supra note 21), a survey of clock synchronization practices and costs (see supra note 247), discussions with members of the industry and service bureaus (see Section V.F.1.c and Section V.F.1.d, infra), data from FINRA (see Section V.F.1.c.(2).B., infra), and academic literature. See Notice, supra note 5, at 30655–56.

¹⁸⁶⁶ As discussed below, the Commission notes that many of the uncertainties that existed at the time of the Notice will continue upon approval of the Plan. For example, the Funding Model and Technical Specifications will be determined after a Plan Processor is selected.

¹⁸⁶⁷ See Notice, supra note 5, at 30655–56.

costs and discretionary decisions in the Plan, including the Funding Model. Specifically, the Plan does not outline the proportion of CAT costs that will be allocated to Participants versus broker-dealers. This uncertainty limited the Commission’s ability to evaluate the economic effects of the Plan in some cases. However, the Commission analyzed the expected economic effects of the Plan to the extent possible with the information available, and where the Commission identified such areas of uncertainty, the economic analysis addressed this uncertainty.

Second, the Commission pointed out that certain elements of the CAT NMS Plan will not be finalized until after the selection of a “Plan Processor.”¹⁸⁶⁸ Among these are the security and confidentiality procedures of the Central Repository,¹⁸⁶⁹ the precise methods by which regulators will access data in the Central Repository,¹⁸⁷⁰ and the complete Technical Specifications.¹⁸⁷¹ The Plan also provides the Plan Processor the “sole discretion” to publish interpretations of the Technical Specifications, including interpretations of permitted values in data elements.¹⁸⁷²

¹⁸⁶⁸ See CAT NMS Plan, *supra* note 5, at Article VI. The Plan Participants have engaged in a bidding process to select a Plan Processor, and the leading candidate bidders have proposed different solutions. In certain instances, the Plan Participants have decided to adopt the solutions proposed by whichever bidder they select.

¹⁸⁶⁹ See Section V.F.4.b, *infra*, for additional discussion of risks and uncertainties related to data security.

¹⁸⁷⁰ Rule 613(e)(1) requires the CAT NMS Plan to create a Central Repository to collect, link, and store CAT Data and to make that data available to regulators. See 17 CFR 242.613(e)(1).

¹⁸⁷¹ The CAT NMS Plan contains minimum standards and principles for setting many of Technical Specifications, see CAT NMS Plan, *supra* note 5, at Section 6.9, and the Commission’s economic analysis reflects those minimum standards and principles. However, because the detailed Technical Specifications are not yet finalized by the Participants, the Commission cannot fully assess any corresponding costs and benefits.

¹⁸⁷² *Id.* at Section 6.9.

Because these and other elements of the Plan had not yet been finalized, the Commission could not assess how and to what extent the elements could affect the overall economic effects of the Plan. The Commission's economic analysis was therefore limited to the extent that the economic effects of the Plan depend on decisions that will be made after approval of the Plan. However, the Commission identified these areas of uncertainty and assessed the economic effects of the Plan to the best of its ability in light of these existing uncertainties.

Given the range of possible outcomes with respect to both the costs and benefits of the CAT NMS Plan that depend on future decisions, the Commission also recognized in the Notice the importance of provisions of the Plan related to the operation and administration of the CAT. In particular, the Commission stated that governance provisions of the Plan related to voting by the Operating Committee and the involvement of the Advisory Committee may help promote better decision-making by the relevant parties. Such provisions could mitigate concerns about potential uncertainty in the economic effects of the Plan by giving the Commission greater confidence that its expected benefits would be achieved in an efficient manner and that costs resulting from inefficiencies will be avoided. Nevertheless, commenters rightly observed that uncertainties remain, and will continue to remain until selection of the Plan Processor, the publication of Technical Specifications, and/or the implementation of CAT reporting.¹⁸⁷³

¹⁸⁷³ Many commenters identified uncertainties related to the economic effects of the Plan that were consistent with those mentioned in the Notice. See SIFMA Letter at 6, 13, 15–16, 23, 32, 39, 40, 42, 44, 45; FIF Letter at 36, 50, 84–85, 86–90; FSI Letter at 5–6; FSR Letter at 9–10; DAG Letter at 5; UnaVista Letter at 2; TR Letter at 4; Fidelity Letter at 6; Data Boiler Letter at 9, 26, 30. Commenters also discussed several implications of the uncertainty in the Plan that were consistent with the Commission's statement in the Notice that it cannot assess how and to what extent these elements of the Plan could affect the overall economic effects of the Plan. See FSR Letter at 9; FSI Letter at 5–6;

The Commission has considered the comments it received relevant to the potential uncertainties in its analysis of the economic effects of the CAT NMS Plan, the Participants' response, and the effect of Plan modifications on such uncertainties and has revised its economic analysis accordingly. Throughout this economic analysis, the Commission recognizes these uncertainties, including the ones raised by commenters. In particular, the economic analysis described below recognizes uncertainties as they relate to the baseline, benefits, and costs and as they relate to the analysis of alternatives, efficiency, competition, and capital formation. In some cases, the Plan modifications and the Participants' response letters reduce the uncertainty in the Commission's analysis. However, the Commission continues to believe that governance provisions of the Plan could mitigate concerns about many of the sources of potential uncertainty in the economic effects of the Plan.¹⁸⁷⁴

D. Baseline

To assess the overall economic impact of the CAT NMS Plan, the economic analysis in the Notice used as the Baseline the current state of regulatory activity and the current state of trade and order data.¹⁸⁷⁵ The Baseline discussed the currently available sources of data, limitations in available data that could impact regulatory activity, how regulators currently use the available data, and the burden that producing that data imposes on SROs and broker-dealers. As discussed in more detail below, the Commission has revised certain aspects of its Baseline to

TR at 4. Others highlighted implications for the Commission to consider. See, e.g., Fidelity Letter at 6; SIFMA Letter at 23–24, 44.

¹⁸⁷⁴ For a full discussion of the governance provisions and how they may mitigate concerns about many of the sources of potential uncertainty in the economic effects of the Plan, see Section V.E.3.d, infra.

¹⁸⁷⁵ See Notice, supra note 5, at 30656–59.

incorporate new information from commenters, but the Baseline remains largely the same as that described in the Notice.

1. Current State of Regulatory Activities

As addressed in detail in the Notice, SROs and the Commission use data to analyze and reconstruct market events, conduct market analysis and research in support of regulatory decision-making, and conduct market surveillance, examinations, investigations, and other enforcement functions.¹⁸⁷⁶ The trend in this area is to use more automated and data-intensive methods as regulators' activities adjust to the data and technology available. The Notice described these regulatory activities and how regulators currently use data. While the Commission did not receive any comments on its description of the current state of regulatory activities, the Participants did confirm the use of real-time surveillance and monitoring tools by SROs. The Commission continues to believe that the current state of regulatory activity, as described in detail in the Notice and as summarized below, reflects the Baseline for the CAT NMS Plan.

a. Analysis and Reconstruction of Market Events

In the Notice, the Commission discussed how regulators currently analyze and reconstruct market events.¹⁸⁷⁷ In terms of market reconstructions, currently, regulators aim to provide an accurate and factual accounting of what transpired during a market event of interest by conducting a thorough analysis of the available market data.¹⁸⁷⁸ Market events often encompass activity in many securities across multiple trading venues, and analysis and

¹⁸⁷⁶ Id.

¹⁸⁷⁷ Id. at 30656–57.

¹⁸⁷⁸ Id.

reconstruction of these market events requires linking data from multiple sources.¹⁸⁷⁹ Examples of recent market reconstructions include the Commodity Futures Trading Commission (“CFTC”) and SEC’s analysis of the May 6, 2010 “Flash Crash,”¹⁸⁸⁰ analysis of equity market volatility on August 24, 2015,¹⁸⁸¹ and the multi-agency report on the U.S. Treasuries market on October 15, 2014.¹⁸⁸²

b. Market Analysis and Research

In the Notice, the Commission discussed how regulators currently perform market analysis and research.¹⁸⁸³ In terms of market analysis and research, as addressed in detail in the Notice, the Commission and SRO Staffs currently conduct data-driven analysis on market structure, in direct support of both rulemaking and other regulatory decisions such as SRO rule

¹⁸⁷⁹ Id. Examples of recent market reconstructions include the Commodity Futures Trading Commission (“CFTC”) and SEC’s analysis of the May 6, 2010 “Flash Crash,” analysis of equity market volatility on August 24, 2015, and the multi-agency report on the U.S. Treasuries market on October 15, 2014.

¹⁸⁸⁰ See Findings Regarding the Market Events of May 6, 2010: Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on Emerging Regulatory Issues (September 30, 2010) (“Flash Crash Analysis”), available at <http://www.sec.gov/news/studies/2010/marketevents-report.pdf>.

¹⁸⁸¹ See Staff of the Office of Analytics and Research, Division of Trading and Markets, Research Note: Equity Market Volatility on August 24, 2015 (Dec. 2015), available at http://www.sec.gov/marketstructure/research/equity_market_volatility.pdf; see also Austin Gerig and Keegan Murphy, The Determinants of ETF Trading Pauses on August 24th, 2015, White Paper (February 2016), available at http://www.sec.gov/marketstructure/research/determinants_eft_trading_pauses.pdf.

¹⁸⁸² See U.S. Department of the Treasury, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, U.S. Securities and Exchange Commission, and U.S. Commodity Futures Trading Commission, Joint Staff Report: The U.S. Treasury Market on October 15, 2014 (July 13, 2015), available at <http://www.sec.gov/reportspubs/special-studies/treasury-market-volatility-10-14-2014-joint-report.pdf>.

¹⁸⁸³ See Notice, supra note 5, at 30657.

approvals as well as retrospective analyses of rules and pilots.¹⁸⁸⁴ The Commission relies on data analysis to inform its market structure policy, and SROs also conduct market analysis and research on their own regulatory initiatives. Examples of data-driven market analysis include reports on OTC trading,¹⁸⁸⁵ small capitalization stock trading,¹⁸⁸⁶ the Limit Up-Limit Down Pilot,¹⁸⁸⁷ short selling,¹⁸⁸⁸ and high frequency trading.¹⁸⁸⁹

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Id.

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See Laura Tuttle, Alternative Trading Systems: Description of ATS Trading in National Market System Stocks (October 2013) available at <http://www.sec.gov/divisions/riskfin/whitepapers/alternative-trading-systems-10-2013.pdf>; Laura Tuttle, OTC Trading: Description of Non-ATS OTC Trading in National Market System Stocks (March 2014), available at <http://www.sec.gov/dera/staff-papers/white-papers/otc-trading-white-paper-03-2014.pdf>.

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See Securities Exchange Act Release No. 74892, Order Approving the National Market System Plan to Implement a Tick Size Pilot Program (May 6, 2015), 80 FR 27514, 27534, 27541 (May 13, 2015); see also Charles Collver, A Characterization of Market Quality for Small Capitalization US Equities (September 2014), available at http://www.sec.gov/marketstructure/research/small_cap_liquidity.pdf.

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See SRO Supplemental Joint Assessment, available at <http://www.sec.gov/comments/4-631/4-631.shtml>; Memo to File from the Division of Economic and Risk Analysis regarding the Cornerstone Analysis of the Impact of Straddle States on Options Market Quality (February 8, 2016), available at <http://www.sec.gov/comments/4-631/4631-42.pdf>; see also Gerig and Murphy, supra note 1881.

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See Memo to Chairman Christopher Cox from Daniel Aromi and Cecilia Caglio regarding an Analysis of Short Selling Activity during the First Weeks of September 2008, (December 16, 2008), available at <http://www.sec.gov/comments/s7-08-09/s70809-369.pdf>; Memo to Chairman Christopher Cox from Daniel Aromi and Cecilia Caglio regarding an Analysis of a Short Sale Price Test Using Intraday Quote and Trade Data (December 17, 2008), available at <http://www.sec.gov/comments/s7-08-09/s70809-368.pdf>; Memo from the Office of Economic Analysis regarding an Analysis of the July Emergency Order Requiring a Pre-borrow on Short Sales (January 14, 2009) available at <http://www.sec.gov/spotlight/shortsales/oeamemo011409.pdf>.

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See Austin Gerig, High-Frequency Trading Synchronizes Prices in Financial Markets, (January 2015), available at <http://www.sec.gov/dera/staff-papers/working-papers/dera-wp-hft-synchronizes.pdf>; see also Staff of the Office of Analytics and Research, Division of Trading and Markets, Research Note: Equity Market Volatility on August 24, 2015

c. Market Surveillance and Investigations

As explained in detail in the Notice, regulators perform market surveillance and investigation functions that rely on access to multiple types of market data.¹⁸⁹⁰ The following Sections summarize the discussion from the Notice describing the current state of SRO surveillance and SRO and Commission examinations and enforcement investigations.

(1) Current SRO Surveillance

Rule 613(f) requires the SROs to develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the CAT Data.¹⁸⁹¹ For the purposes of the economic analysis in the Notice, the Commission considered surveillance to involve SROs running automated processes on routinely collected or in-house data to identify potential violations of rules or regulations.¹⁸⁹² For instance, SROs use surveillance systems, developed internally or by a third party, to detect violations of trading rules, market abuse, or unusual behavior, in real time, within one day, or within a few weeks of the activity in question. As discussed in the Notice, SRO surveillance can help protect investors by detecting fraudulent behavior and anomalous trading.

Currently, exchange-operating SROs use surveillance systems and are responsible for surveillance of their own market. As discussed in the Notice, FINRA conducts off-exchange and

(December 2015), available at http://www.sec.gov/marketstructure/research/equity_market_volatility.pdf.

¹⁸⁹⁰ See Notice, *supra* note 5, at 30657–59.

¹⁸⁹¹ 17 CFR 242.613(f).

¹⁸⁹² See Notice, *supra* note 5, at 30657–58.

cross-market surveillance¹⁸⁹³ and oversees and regulates OTC trading of exchange-listed and non-exchange-listed securities, as well as trading in corporate and municipal debt instruments and other fixed income instruments. FINRA also provides surveillance services to U.S. equity and options exchanges through regulatory services agreements with nearly every equity market and all options exchanges. Additional surveillance is conducted by exchange-operating SROs and some of this additional surveillance is conducted as trading activity occurs. This surveillance can include detection of market manipulation, violations of trading rules, and other unusual behavior.

While there were no explicit comments pertaining to the current practices regarding SRO surveillance, the Participants' responses confirm that they have real-time surveillance and monitoring tools in place for their respective markets.¹⁸⁹⁴

(2) Examinations

In the Notice, the Commission discussed how regulators currently perform examinations.¹⁸⁹⁵ As addressed in detail in the Notice, SROs currently conduct exams of broker-dealers for violations of trading-related federal laws, rules, and regulations and for violations of SRO rules and regulations.¹⁸⁹⁶ In 2015, FINRA's Member Regulation Department conducted

¹⁸⁹³ FINRA conducts cross-market surveillance for approximately 99% of the listed equity market and approximately 70% of the listed options market. See Notice, supra note 5, at 30657.

¹⁸⁹⁴ Response Letter I at 31.

¹⁸⁹⁵ See Notice, supra note 5, at 30658.

¹⁸⁹⁶ Id.

approximately 2,400 broker-dealer examinations.¹⁸⁹⁷ Currently, the Commission conducts exams of broker-dealers, transfer agents, investment advisers, investment companies, municipal advisers, clearing agencies, the national securities exchanges, other SROs such as FINRA and the Municipal Securities Rulemaking Board, and the Public Company Accounting Oversight Board (“PCAOB”).¹⁸⁹⁸ For example, the Commission conducted 493 broker-dealer examinations in 2014 and 484 in 2015, and 70 exams of the national securities exchanges and FINRA in 2014 and 21 in 2015. In addition, the Commission conducted 1,237 investment adviser and investment company examinations in 2014 and 1,358 in 2015. Virtually all investment adviser examinations and a significant proportion of the Commission’s other examinations involve analysis of trading and order data. Examinations of broker-dealers and investment advisers involve intensive analysis of trading data. Examinations seek to determine whether the entity being examined is: conducting its activities in accordance with the federal securities laws, rules adopted under these laws, and SRO rules; adhering to the disclosures it has made to its clients, customers, the general public, SROs and/or the Commission; and implementing supervisory systems and/or compliance policies and procedures that are reasonably designed to ensure that the entity’s operations are in compliance with the applicable legal requirements.¹⁸⁹⁹ In order to select candidates for examination, the Commission and

¹⁸⁹⁷ Id. This estimate was based on Staff discussions with FINRA. See also FINRA Overview of Member Regulation, available at <http://www.finra.org/industry/member-regulation>.

¹⁸⁹⁸ Id.

¹⁸⁹⁹ See SEC, Examination Information for Entities Subject to Examination or Inspection by the Commission (June, 2014), available at http://www.sec.gov/about/offices/ocie/ocie_exambrochure.pdf.

certain SROs, including FINRA,¹⁹⁰⁰ use a risk-based approach. “Risk-based examinations” seek to increase regulatory efficiency by using preliminary data analysis to direct examination resources towards entities and activities where risks of violative or illegal activity are the highest. The Commission uses risk and data analysis before opening an exam to identify broker-dealers and investment advisers for areas of focus such as suspicious trading, as well as during an exam to identify the particular activities of a broker-dealer or investment adviser that could trigger certain compliance and supervisory risks.

(3) Enforcement Investigations

In the Notice, the Commission discussed how regulators currently approach enforcement investigations.¹⁹⁰¹ As explained in detail in the Notice, the Commission and SROs undertake numerous investigations to enforce the securities laws and related rules and regulations, including investigations of market manipulation, insider trading, and issuer repurchase violations.¹⁹⁰² The Commission estimates that 30-50% of enforcement investigations use trade and order data. In 2015, the Commission filed 807 enforcement actions, including 39 related to insider trading, 43 related to market manipulation, 124 related to broker-dealers, 126 related to

¹⁹⁰⁰ FINRA conducts regulatory examinations by contract on behalf of all the options and equities exchanges, except for the Chicago Stock Exchange, Inc. (“CHX”) and the National Stock Exchange, Inc. (“NSX”). Accordingly most exchanges also employ a risk-based approach to examination selection and scope. CHX examines members on a cycle basis. NSX recently resumed operations in December 2015. See Securities Exchange Act Release No. 76640 (December 14, 2015), 80 FR 79122 (December 18, 2015).

¹⁹⁰¹ See Notice, supra note 5, at 30658.

¹⁹⁰² Id. Examples of investigations of market manipulations include marking the close, order layering and spoofing, wash sales, and trading ahead. Layering and spoofing are manipulations where orders are placed close to the best buy or sell price with no intention to trade in an effort to falsely overstate the liquidity in a security.

investment advisers/investment companies, and one related to exchange or SRO duties. In 2014, the Commission filed 755 enforcement actions, including 52 related to insider trading, 63 related to market manipulation, 166 related to broker-dealers, and 130 related to investment advisers/investment companies, many of which involved trade and order data.

The Commission initiates enforcement investigations when SROs or others submit reliable tips, complaints, or referrals, or when the Commission becomes aware of anomalies indicative of manipulation. After the detection of potential anomalies, a tremendous amount of time and resources are expended in gathering and interpreting trade and order data to construct an accurate picture of when trades were actually executed, what market conditions were in effect at the time of the trade, which traders participated in the trade, and which beneficial owners were affected by the trade. The Commission also explained in the Notice that SROs rely primarily on surveillance to initiate investigations based on anomalies in the trading of securities. FINRA brought 1,397 disciplinary actions in 2014 and 1,512 in 2015.

(4) Tips and Complaints

In the Notice, the Commission discussed how regulators currently analyze and investigate tips and complaints.¹⁹⁰³ Market participants or those with experience in analyzing market data sometimes notice atypical trading or quoting patterns in publicly available market data, and these observations sometimes result in a tip or complaint to a regulator. As the Commission discussed in the Notice, regulators investigate thousands of tips and complaints each year.¹⁹⁰⁴ In fiscal years 2014 and 2015, the Commission received around 15,000 entries in its Tips, Complaints and Referrals (“TCR”) system, approximately one third of which related to manipulation, insider

¹⁹⁰³ See Notice, supra note 5, at 30659.

¹⁹⁰⁴ Id.

trading, market events, or other trading and pricing issues. Analysis of tips and complaints generally follow three stages. First, regulators ensure that the tip or complaint contains sufficient information to facilitate analysis. Second, regulators use directly accessible data or make phone calls and other informal queries to determine if the tip or complaint is credible. Third, for tips and complaints that seem credible, regulators then perform a more in-depth investigation or examination, which follows the processes described above for examinations and enforcement investigations.

2. Current State of Trade and Order Data

To assess how and to what degree the CAT NMS Plan would affect the trade and order data available to regulators, the economic analysis in the Notice considered what data regulators use currently and the limitations in that data. The Commission did not receive any comments on its description of the current sources of trade and order data. The Commission received some comments on its description of the current limitations on trade and order data, which are discussed below. However, the Commission continues to believe that the current state of trade and order data, as described in detail in the Notice and as summarized below, reflects the relevant baseline for its economic analysis of the CAT NMS Plan.

a. Current Sources of Trade and Order Data

In the Notice, the Commission stated that SROs and the Commission currently use a range of trading and order data sources¹⁹⁰⁵ for their regulatory activities. The types of data and ease of use of these sources of data can vary widely. The Notice reviewed the primary sources

¹⁹⁰⁵ Id. at 30659–62.

of data currently available to regulators, describing the content of the data provided and examples of their specialized uses.

(1) SRO Data

As discussed in detail in the Notice, SROs maintain audit trails that contain trade and order data that they obtain from their members. Currently, regulators have access to at least three sources of audit trail data. First, the National Association of Securities Dealers (“NASD”) established its OATS in 1998, which required NASD (n/k/a FINRA) members to report certain trade and order data regarding NASDAQ-listed equity securities. OATS was later expanded to include OTC Equity Securities and all NMS stocks. Second, beginning in 2000, several of the current options exchanges implemented the Consolidated Options Audit Trail System (“COATS”). Finally, each equities and options exchange keeps an audit trail of orders and trades that occur on its market.¹⁹⁰⁶

The Commission explained that for each of these stages in the life of an order, FINRA Rule 7440 requires the recording and reporting of the following information, as applicable, including but not limited to: for the receipt or origination of the order, the date and time the order was first originated or received by the reporting member, a unique order identifier, the market participant symbol of the receiving reporting member, and the material terms of the order; for the internal or external routing of an order, the unique order identifier, the market participant symbol of the member to which the order was transmitted, the identification and nature of the department to which the order was transmitted if transmitted internally, the date and time the order was received by the market participant or department to which the order was transmitted, the material

¹⁹⁰⁶ Id. at 30659.

terms of the order as transmitted, the date and time the order was transmitted, and the market participant symbol of the member who transmitted the order; for the modification or cancellation of an order, a new unique order identifier, original unique order identifier, the date and time a modification or cancellation was originated or received, and the date and time the order was first received or originated; and for the execution of an order, in whole or in part, the unique order identifier, the designation of the order as fully or partially executed, the number of shares to which a partial execution applies and the number of unexecuted shares remaining, the date and time of execution, the execution price, the capacity in which the member executed the transaction, the identification of the market where the trade was reported, and the date and time the order was originally received. FINRA Rule 7440 also requires reporting of the account type, the identification of the department or terminal where an order is received from a customer, the identification of the department or terminal where an order is originated by a reporting member, and the identification of a reporting agent if the agent has agreed to take on the responsibilities of a reporting member under Rule 7450.¹⁹⁰⁷

The Commission also explained that a majority of options exchanges require their members to provide the following information with respect to orders entered onto their exchange: (1) the material terms of the order; (2) order receipt time; (3) account type; (4) the time a modification is received; (5) the time a cancellation is received; (6) execution time; and (7) the clearing member identifier of the parties to the transaction.¹⁹⁰⁸

¹⁹⁰⁷ Id. at 30659–60. The Notice provided further details on the reporting requirements of FINRA Rule 7440. Id. at 30659–60 nn.354–57.

¹⁹⁰⁸ Id. at 30660. The Notice provided further details on the reporting requirements of options exchanges. Id. at 30660 nn.358–59. The Notice also outlined the reporting requirements of other SRO audit trails. Id. at 30660 n.364.

As discussed in the Notice, SRO audit trail data is used for market reconstructions and market analyses, and to inform policy decisions, both by the Commission and by SROs. Regulators also use SRO audit trail data extensively for surveillance, examinations, investigations, and other enforcement functions. Current SRO market surveillance relies primarily on data from the SRO audit trails, generated directly from the exchange servers and from OATS. Likewise, SRO examinations and investigations pull information from their own audit trails before seeking data from others. Commission examinations and investigations also rely heavily on SRO audit trails to start the process of tracing a particular trade from its execution to the order initiation and customer information, and the audit trails can be useful for manipulation investigations or other regulatory activities that require analyses of microcap securities trading activity.¹⁹⁰⁹

(2) Equity and Option Cleared Reports

The SROs and the Commission also have access to equity and option cleared reports. In the Notice, the Commission noted that clearing broker-dealers report their equity and option cleared data on a daily basis and the NSCC and the OCC aggregate the data across the market and generate the reports.¹⁹¹⁰ Equity and option cleared reports provide a way for regulators to directly access a dataset to see how much trading volume is accounted for by a particular clearing broker. As such, these data are often used at the beginning of an examination or

¹⁹⁰⁹ Id. at 30660.

¹⁹¹⁰ Equity and option cleared reports show “the number of trades and daily cleared trade and share volume, by clearing member, for each equity and listed option security in which transactions took place. Regulators can query these reports directly through an internal online system that interfaces with the Depository Trust and Clearing Corporation (“DTCC”) data by security name and CUSIP number.” A CUSIP number is a “unique alphanumeric identifier assigned to a security and facilitates the clearance and settlement of trades in the security.” Id.

investigation to start identifying the market participants that may have additional data needed to pinpoint a particular activity.

(3) Electronic Blue Sheets

As the Commission discussed in the Notice, broker-dealers also provide detailed data to regulators in the form of Electronic Blue Sheets (“EBS”). The EBS data, provided pursuant to Rule 17a-25 under the Act, facilitate investigations by the SROs and Commission Staff, particularly in the areas of insider trading and market manipulations. The EBS system provides certain detailed execution information in its electronic format upon request by SRO or Commission Staff. This information often includes the employer of the beneficial owner of an account, which can be important to insider trading investigations, and in some cases, a tax identification number.¹⁹¹¹

The EBS system also provides additional information on market participants who meet the definition of “large traders” and have self-identified to the Commission as required by Rule 13h-1. Large trader data provide the Commission with a way to acquire information about the activities of large traders and allow the activities of large traders to be more readily aggregated across or partitioned by multiple broker-dealers.¹⁹¹²

(4) Trade Blotters and Order Tickets

As the Commission addressed in detail in the Notice, investment advisers and broker-dealers also maintain data in the form of order tickets and trade blotters that regulators can obtain on request. Order tickets are in-house records maintained by investment advisers and broker-

¹⁹¹¹ Id. at 30661. The Notice provided further details on Rule 17a-25 and its reporting requirements. Id. at 30661, notes 368–369.

¹⁹¹² Id. The Notice provided the definition of a “large trader” and further details on the reporting requirements of Rule 13h-1. Id.

dealers that provide order details, including timestamps of order initiation and placement, special order types, any special instructions for the order, and plans for the allocation of shares and prices across accounts and subaccounts. Order tickets also identify account owners. Commission Staff collects order tickets regularly for examinations, and occasionally also for market manipulation investigations.¹⁹¹³

The Commission discussed the fact that broker-dealers maintain data in trade blotters that are similar to EBS. However, the trade blotters also contain more information, including the commissions paid in executing each order, timestamps of when an order is received and when it is executed (and the number of fills), and the pricing information for all executions in the order. SROs use trade blotters in examinations of their members. Commission Staff uses trade blotters frequently for examinations, including in almost every broker-dealer, investment adviser, and hedge fund examination, as well as for insider trading and market manipulation investigations. Regulators use trade blotter data to determine the order entry time and execution time for trades by a particular customer in examinations and enforcement investigations. Trade blotters are also the primary data source used in regulatory investigations for which subaccount allocation information is important for determining violative behavior, such as cherry-picking and front-running cases.¹⁹¹⁴

As the Commission discussed in the Notice, broker-dealers and exchanges collect and maintain records of activity in their order handling systems and internal matching systems.¹⁹¹⁵

¹⁹¹³ Id.

¹⁹¹⁴ Id.

¹⁹¹⁵ “Internal matching systems of broker-dealers may include Alternative Trading Systems (“ATs”) or automated trading systems that provide liquidity to received orders without interacting on a registered exchange. The Commission understands that some broker-

Some of the data that is collected and maintained in these systems exceeds the scope of information captured in EBS, SRO audit trail, trade blotter, or order ticket data and may include data on order receipt, modification or routing information not otherwise reported to SROs. Regulators use these trading and order handling system data in investigations and examinations to further analyze issues discovered during their analysis of data from other sources.¹⁹¹⁶

(5) Public Data

As discussed in detail in the Notice, exchanges and SROs make some data available to the public and regulators can access these data for their regulatory activities. One type of public data is “consolidated” data feeds that are disseminated by registered Securities Information Processors (“SIPs”) pursuant to joint SRO plans. For a fee, the SIPs distribute consolidated market data on recent equity and option transactions and the prevailing best quotes at each exchange to market data subscribers. Additionally, all exchanges also make data available through direct data feeds. These feeds contain all data included in the SIP feed, but also include depth of book information and, depending on the exchange, may include additional data, such as the submission, cancellation and execution of all displayed orders and auction imbalance information on the exchange, among other things. Furthermore, at the request of Commission Staff, most equities exchanges also produce and make public two datasets with information on short sales: a file of short selling volume by stock, which contains the short selling and total

dealers rely on their clearing firms to collect and maintain records relating to routed orders on their behalf. Broker-dealers that operate their own internal matching systems are more likely to collect and maintain their own records.” Id. at 30662.

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Id.

volume on that exchange by symbol, and a file of short selling transactions, which contains trade information such as time, volume, and price for each transaction involving a short sale.¹⁹¹⁷

The Commission and SROs use these publicly available trade and order data to conduct market analyses, market reconstructions, examinations, and investigations. Due to the accessibility and ease of use of the public data, regulators often use it as a starting point or a basis of comparison to other data sources. For example, real-time surveillance can rely on SIP data, and some insider trading surveillance relies on information from other publicly available sources such as news sources. Further, investigations into short sale market manipulation sometimes start with an analysis of the short selling data.¹⁹¹⁸

b. Current Limitations of Trade and Order Data

As the Commission addressed in detail in the Notice, while regulators have access to trade and order data from the sources described above,¹⁹¹⁹ the available data are, for various reasons, limited in terms of the four qualities discussed above.¹⁹²⁰ In terms of completeness, current sources do not represent all of the market activity of interest in sufficient detail in one consolidated audit trail. In terms of accuracy, current sources may reflect data errors, insufficiently granular clock synchronization and timestamps, errors introduced in the process of combining data from different sources, a lack of consistent customer and broker-dealer identifiers, and data that is too aggregated at the record level to provide the information regulators need. In terms of accessibility, the SROs and Commission lack direct access to most

¹⁹¹⁷ Id.

¹⁹¹⁸ Id.

¹⁹¹⁹ See Section V.D.2(a), supra.

¹⁹²⁰ See Notice, supra note 5, at 30662–74.

of the data sources described above, and with respect to timeliness, obtaining trade and order data from current sources and converting the data into a form in which they can be analyzed can involve a significant delay from the time of a particular event of interest. Due to these limitations on current data sources, as the Commission addressed in detail in the Notice, regulators are limited in their ability to perform the activities outlined in Section V.D.1, above. Table 1 summarizes the key characteristics of the currently available data sources, the limitations of which are discussed in more detail below.

Table 1

	Customer Identifier	Broker- Dealer Identifier	TimeStamp ¹⁹²¹	Allocation information	Order Display Information	Buy-to-Cover Indicator	Special Handling Instructions	Routing/ Modification/ Cancellation information	Entire Lifecycle	Direct Access for Regulators	Off-Exchange Activity ¹⁹²²	Timeliness of Data Compiling ¹⁹²³
OATS	No	Yes	Yes (majority in milliseconds but some in seconds)	No	Yes (for limit orders)	No	Yes (conditional)	Yes	Yes (before order reaches exchange) No (once order reaches exchange)	No (except FINRA). Access can take several weeks	Yes	Raw Data: T+1 Corrected Data: T+6
COATS	No	Yes	Yes	No	No	No	No	Yes	No	No (except SROs w/r/t their own members)	No	Reported same-day, but separate file transmitted at latest T+1
SRO Audit Trails	No	Yes	Yes (majority in milliseconds but some in seconds)	No	No	No	No	Yes	No (only once order reaches exchange)	No (except SROs w/r/t their own trails). Access can take several weeks	No	As soon as a trade is executed.
Equity and Option Cleared Reports	No	No	No	No	No	No	No	No	No	Yes	Yes	Equity: T+3 Option: T+1
Electronic Blue Sheets	Yes (but not always consistent across broker-dealers) ¹⁹²⁴	Yes (but not always consistent across broker-dealers)	Yes	No	No	No	No	No (except for certain cancellation information)	No	No. Access can take several weeks or months	Yes	10 business days after request is submitted
Trade Blotters/Order Tickets	Yes (but not always consistent across broker-dealers)	Yes (but not always consistent across broker-dealers)	Yes (can be requested, although not always reliable)	No	No	No	No	No	No	No. Access can take several days	Yes	Same-day
Trading and Order Handling System Data	Depends on the trader	Yes	Yes	No	No	No	No	Yes	Yes (except allocations)	No. Regulators must request this data (SEC asks for the data within 10 days)	Yes	Same-day
Public/ Proprietary Data	No	No	Yes (varied between seconds and microseconds)	No	No	No	No	Yes (except non-displayed orders)	No	Yes	Yes	Same-day

¹⁹²¹ As proposed, the CAT NMS Plan also requires CAT Reporters to synchronize their time clocks to the time maintained by the NIST with an allowable drift of 50 milliseconds. See CAT NMS Plan, *supra* note 5, at Section 6.8. According to a survey conducted by the FIF, 39% of responding broker-dealers currently synchronize their clocks with less precision than what is called for by the CAT NMS Plan. Thus, the CAT NMS Plan would also increase the accuracy of the timestamps used by certain broker-dealers. See FIF Clock Offset Survey, *supra* note 247.

¹⁹²² Off-exchange activity includes currently reportable events that are not handled by a registered securities exchange.

¹⁹²³ In this instance, “timeliness” refers to when the data are compiled at the source in question (e.g., when OATS receives data from reporting broker-dealers), *not* when they become available to regulators because that timeline can vary depending on the regulator in question. As shown in the “Direct Access for Regulators” column, it may still take several days, weeks, or months for regulators to be able to access the data. For example, while OATS reporters provide the data at T+1, the SEC must request OATS data in order to access it, which may take several days or weeks. This narrower definition of timeliness is not used throughout this economic analysis.

¹⁹²⁴ Guidance from FINRA indicates that broker-dealers must “identify the party to the trade” through EBS fields such as “Primary Party Identifier,” but that party may be another broker-dealer rather than the ultimate customer. See FINRA, Electronic Blue Sheet Submissions, FINRA and ISG Extend Effective Date for Certain Electronic Blue Sheet Data Elements, Regulatory Notice 12-47 (Oct. 2012), [available at https://www.finra.org/sites/default/files/NoticeDocument/p194655.pdf](https://www.finra.org/sites/default/files/NoticeDocument/p194655.pdf). Similarly, under the large trader rule, persons exercising “investment discretion” are reported through EBS, but in some cases such persons are investment advisers rather than their customers. See Notice, *supra* note 5, at note 372 and accompanying text (discussing the large trader rule).

(1) Completeness

“Completeness” refers to whether the data represents all market activity of interest or just a subset, and whether the data is sufficiently detailed to provide the required information.¹⁹²⁵ As addressed in detail in the Notice, while current data sources provide trade and order data specified by existing rules and regulations, those sources do not contain all market activity that might be required for certain market inquiries, in sufficient detail, within one consolidated audit trail. The Commission explained in the Notice that, to obtain information regarding a particular market event, regulators may have to piece together information from different data sources and that some data is not required to be reported at all under existing regulations. Therefore, as described below, current data sources either cover only a limited number of events and products, or lack some data fields that would be useful to regulators, each of which impedes effective market surveillance.¹⁹²⁶

One commenter agreed with the Commission’s analysis by stating that “[t]he fragmented nature of current data sources does pose significant challenges to regulators seeking complete data.”¹⁹²⁷

A. Events and Products

As the Commission addressed in detail in the Notice, there is currently no single data source that covers all market activities. EBS data contains executed trades but does not contain information on orders or quotes (and thus does not provide information on routes, modifications, or cancellations). Similarly, trade blotters and order tickets contain only information recorded by

¹⁹²⁵ Id. at 30664.

¹⁹²⁶ Id.

¹⁹²⁷ Data Boiler Letter at 30.

the particular broker-dealer or investment adviser that generated them and may contain limited information about full order lifecycles. SRO audit trail data are limited to identifying the activity of their members, can have incomplete information concerning their members, lack order lifecycle information occurring prior to receipt by an exchange, and may not contain information regarding principal trading. Furthermore, although public consolidated and direct data feeds provide data about the entire market, they lack information regarding non-displayed orders and do not provide sufficient information to identify the different lifecycle events of a single order.¹⁹²⁸

The Commission also discussed individual SRO audit trails. While extensive, they contain only activity of their own members, and many SRO audit trails are incomplete in their coverage of the activities of those members. For example, FINRA's OATS data does not include proprietary orders originated by a trading desk in the ordinary course of a member's market making activities, or options data. And while OATS collects data from FINRA members with respect to orders and trades involving NMS and OTC stocks, OATS does not include trade or order activity that occurs on exchanges or at broker-dealers that are not FINRA members. In addition, while broker-dealers who are not members of FINRA must be members of an exchange SRO, an individual exchange SRO's audit trail data is generally limited to activity taking place on that exchange. The Commission noted that because broker-dealers who are not members of FINRA may engage in trading activity in off-exchange markets, a substantial portion of the trading activity that an exchange SRO supervises is not reported to the supervising SRO.¹⁹²⁹ The Commission also discussed the fact that not all FINRA members are obligated to report to

¹⁹²⁸ See Notice, supra note 5, at 30664.

¹⁹²⁹ Id.

OATS. FINRA’s rules exclude from reporting certain members that engage in a non-discretionary order routing process. Additionally, FINRA has the authority to exempt the manual orders of other members who meet specific criteria from the OATS recording and reporting requirements.¹⁹³⁰

The Commission also explained that some SRO audit trails do not include and are not required to include activity associated with principal trading, such as market-making activity. This may result in the exclusion of a significant amount of activity, particularly for firms with substantial market-making business activities.¹⁹³¹

Finally, the Commission discussed the fact that no single current data source integrates both equities and options, and that the lack of any combined equity and options audit trail data is a significant impediment to regulators performing cross-product surveillance.¹⁹³²

B. Data Fields

As addressed in detail in the Notice, each of the currently available data sources discussed above is missing certain data fields that are useful for conducting a variety of regulatory activities. Furthermore, certain valuable data fields are not contained in any of the data sources discussed above.¹⁹³³

Most notably, as the Commission explained in detail in the Notice, the identity of the customer is not available from any of the current data sources that are reported to regulators on a routine basis. As discussed in the Notice, a unique customer identifier could be useful for many

¹⁹³⁰ Id. (citing FINRA Rule 7470). At the time of the Notice, FINRA had granted approximately 50 such exemptions.

¹⁹³¹ Id. at 30665.

¹⁹³² Id.

¹⁹³³ Id.

types of investigations and examinations such as market manipulation investigations and examinations of investment advisers. The Commission also explained that although some data sources—specifically large trader reports, EBS, trade blotters, and order tickets—identify customers, these data sources are not reported on a routine basis, provide only one part of the order lifecycle, and have other inherent limitations.¹⁹³⁴

The Commission explained that because there is currently no data source that includes customer identities across multiple parts of an order lifecycle, regulators must seek and link multiple sources of data, which can be a burdensome and imperfect process. For example, trade blotter and order ticket data that identify customers from one broker-dealer may only include customer names and thus may not be readily matched to similar data from another broker-dealer, or may require substantial time, effort, and uncertainty to reconcile across firms. Further, EBS data’s limited coverage of trading activity and lack of some detailed trade information raises costs and reduces the timeliness of insider trading investigations.¹⁹³⁵

As the Commission addressed in detail in the Notice, some valuable data fields, such as modifications that make an order non-displayed and other special handling instructions are consistently available on only a few data sources or require linking different data sources.¹⁹³⁶

The Commission explained that the lack of direct, consistent access to order display information

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Id.

¹⁹³⁵

Id. for a full discussion of the impact on insider trading investigations.

¹⁹³⁶

In the Notice, the Commission provided further details on the reporting of order display information (i.e., whether the size of the order is displayed or non-displayed) and special handling instructions in OATS data. The Commission also noted that this data is not directly available to all regulators, and that the Commission must request this data from FINRA. Id. at 30666 n.412.

and special handling instructions creates inefficiencies in surveillances, examinations, and investigations that examine hidden liquidity and the treatment of customer orders.¹⁹³⁷

The Commission noted that data that are not directly accessible by regulators at all include buy-to-cover information and subaccount allocation information, including the allocation time. The Commission explained that regulators could use buy-to-cover information to better understand short selling and for investigations of short sale manipulation. However, no current data source allows regulators to directly identify when someone is buying to cover a short sale.¹⁹³⁸

As the Commission discussed in the Notice, subaccount allocation information needed for regulatory activities can be difficult for regulators to collect and compile because SRO audit trails currently do not require allocation reports and broker-dealers may not have records of the time of a subaccount allocation. The Commission explained that when regulators require an understanding of subaccount allocations for a regulatory task, they generally request and sift through trade blotter or EBS data in an attempt to identify allocations and the details of those allocations. However, current trade blotter data contains limited customer information on allocations and is not required to contain allocation time information at the subaccount level.¹⁹³⁹

The Commission explained that the difficulty in obtaining allocation information and the difficulty in reconstructing allocations with data from broker-dealers limits the efficiency of certain surveillances and examinations. In particular, allocation time at the subaccount level is

¹⁹³⁷ Id. at 30666.

¹⁹³⁸ Id.

¹⁹³⁹ While the Commission is sometimes able to acquire allocation time on trade blotters, not all broker-dealers keep records in a manner that facilitates efficient regulatory requests for allocation time information. Id.

critical for determining whether some customers are systematically given more favorable allocation treatment than others. For example, when a broker-dealer places an order or series of orders for multiple customer accounts that generates multiple executions at multiple prices, it is possible that different customers receive different prices in the allocation process. However, if some customers systematically receive less favorable prices than others when they should be receiving the same prices for their executions, this could indicate that the broker-dealer is handling allocations improperly.¹⁹⁴⁰

Three commenters noted that the open/close indicator is currently not captured for equities.¹⁹⁴¹ In their response, the Participants agreed with this assessment.¹⁹⁴² In addition, the Participants indicated that, pursuant to current industry practice, the open/close indicator is also not captured for some options transactions.¹⁹⁴³

The Commission has considered the comments it received regarding the current limitations of trade and order data in terms of completeness. The open/close indicator would provide information about whether a transaction is undertaken to open or increase a position in the security, or to close or reduce a position in the security, such as a buy-to-cover a short sale, which the Commission in the Notice stated was information not directly accessible to regulators today. Therefore, the commenters expressing that the open/close indicator is not currently captured for equities are consistent with the baseline discussed in the Notice; the open/close indicator is one type of a broader category of information that the Commission recognized is

¹⁹⁴⁰ Id.

¹⁹⁴¹ TR Letter at 9; SIFMA Letter at 35; FIF Letter at 83.

¹⁹⁴² Response Letter I at 22.

¹⁹⁴³ Response Letter I at 22.

lacking from current audit trails.¹⁹⁴⁴ In addition, although the Commission did not discuss this issue in the Notice, the Commission now recognizes that the open/close indicator is currently not captured for certain options transactions.

(2) Accuracy

In the Notice, the Commission carefully considered the accuracy of data currently used by regulators in order to consider whether and to what degree the CAT NMS Plan would provide more accurate data.¹⁹⁴⁵ As discussed in more detail below, the Commission considered several forms of data inaccuracy, including data errors, inaccurate event sequencing, the inability to link data accurately, inconsistent identifiers, and obfuscating levels of irreversible data aggregation.

A. Data Errors

With respect to data errors,¹⁹⁴⁶ the Commission stated its preliminary belief that data errors affect most current data used by regulators and can persist even after corrections. The Commission specifically noted instances where information was inaccurately reported by broker-dealers and discussed various errors in data translated from back-office systems, errors in data

¹⁹⁴⁴ See Notice, supra note 5, at 30680.

¹⁹⁴⁵ Id. at 30666–71.

¹⁹⁴⁶ As used herein, the term “data errors” refers to instances where data reflect false information or are missing information such that they do not reflect order events that occurred in the market fully and accurately. Under this definition of “data errors,” a trading error or an order entry error would not be a “data error.” For example, if a trader submitted an order to an exchange with an order size of 100,000, an accurate order record would contain an order size of 100,000. If the trader actually intended to enter the order size as 1,000, the accurate order record would still be 100,000 because that would reflect the actual state of the market at the time. In other words, the 100,000 order size is not a “data error.” If the trader later corrected the order size, accurate data would reflect the subsequent corrections while still preserving the accurate state of the market at the time.

from trading systems, and errors in audit trail data.¹⁹⁴⁷ Furthermore, the Commission noted that the CAT NMS Plan reports that 2.42% of order events submitted to OATS fail validation checks. Although FINRA sends these records back to its members to correct, significant error rates in event linking post-correction are common because OATS limits error correction requests to records with internal inconsistencies within a given member's submission and there is no cross-participant error resolution process. FINRA estimates that 0.5% of OATS routing reports directed to another FINRA member broker-dealer cannot currently be linked.¹⁹⁴⁸ Also, as stated in the Notice, the CAT NMS Plan reports that, following the rollouts of three major updates to OATS, 0.86% of Trade Reporting Facility reported trades could not be matched to OATS execution reports, 3.12% of OATS route reports could not be matched to exchange orders, and 2.44% of inter-firm routes could not be matched to a record of the receiving firm's receipt of a routed order.¹⁹⁴⁹

The Commission received several comment letters that discussed the current state of errors in data used by regulators.¹⁹⁵⁰ One commenter did not believe that OATS data currently achieves “de minimis” errors.¹⁹⁵¹ The commenter further stated that there are instances where errors cannot be corrected in OATS and gave true duplicates and non-reportable symbols as examples.¹⁹⁵² The commenter further detailed the classification scheme currently used to categorize OATS errors. According to the commenter, these errors are currently classified as:

¹⁹⁴⁷ Id. at 30666–67.

¹⁹⁴⁸ Id.

¹⁹⁴⁹ Id.

¹⁹⁵⁰ Anonymous Letter I at 9–10; Anonymous Letter II at 1–2; FIF Letter at 55, 60.

¹⁹⁵¹ FIF Letter at 60.

¹⁹⁵² FIF Letter at 55.

rejects; unmatched executions; unmatched exchange routes; inter firm received unmatched; inter firm sent unmatched; out of sequence; and late reports.¹⁹⁵³

Another commenter stated in two separate letters that there are OATS reporters that are repeatedly non-compliant, both in omitting to report required data and reporting inaccurate data to FINRA.¹⁹⁵⁴ The commenter contended that the extent of this non-compliance is significant and is magnified by the lengthy period of time before the errors are discovered and corrected by FINRA. Also, there is no way to know the magnitude of noncompliance that is never detected and therefore never corrected. The non-compliance by reporters may cause the error rates reported by OATS to be higher than reported.

The Commission has considered the comments received. The Commission agrees with the commenter that stated there are instances where OATS data does not fail validation checks, but does contain errors. As mentioned in the Notice, OATS validation checks are limited to detecting errors that can be discovered by a concise set of logical rules and OATS limits error correction requests to records with internal inconsistencies within a given member's submission.¹⁹⁵⁵ The Commission also recognizes the comment that some OATS reporters fail to send and/or send inaccurate reports to FINRA and is updating its analysis to take into account that current data errors in OATS may be larger than initially considered due to this non-compliance. Finally, the Commission now considers the error classifications provided by a commenter in its baseline.

¹⁹⁵³ FIF Letter at 54.

¹⁹⁵⁴ Anonymous Letter I at 9–10; Anonymous Letter II at 1–2.

¹⁹⁵⁵ See Notice, supra note 5, at 30667.

B. Event Sequencing

With respect to event sequencing, as the Commission addressed in detail in the Notice, the ability to sequence market events is crucial to the efficacy of detecting and investigating some types of manipulation, and the sequencing of order events requires both sufficient clock synchronization across market participants and timestamps that are granular enough for accurate sequencing, but the current clock synchronization standards make this process difficult.

In the Notice, the Commission discussed that current rules require most broker-dealers to synchronize their system clocks to within one second.¹⁹⁵⁶ The Commission further noted that “in practice” some broker-dealers currently synchronize their clocks to smaller clock offset tolerances. The Commission cited the FIF Clock Offset Survey¹⁹⁵⁷ where 29% of respondents report they currently synchronize their clock to permit a maximum clock offset of one second from NIST, 10% of respondents permit a maximum offset of 50 milliseconds to one second, 21% of respondents permit a 50 millisecond maximum offset, and 18% of respondents permit a maximum offset less than 50 milliseconds. The remaining 22% of respondents report they utilize multiple clock offset tolerances across their systems ranging from five microseconds to one second. In addition, the Commission discussed that FINRA had filed a proposed rule change that would reduce the clock offset tolerance for members’ computer clocks that are used to record events in NMS securities from within one second of the NIST atomic clock to within 50 milliseconds of the NIST atomic clock.¹⁹⁵⁸ Furthermore, the Commission discussed that if the

¹⁹⁵⁶ Id. at 30669.

¹⁹⁵⁷ See FIF Clock Offset Survey, supra note 247.

¹⁹⁵⁸ See Notice, supra note 5, at 30668.

rule change was approved, more entities would record timestamps with data at a 50 millisecond clock offset tolerance regardless of whether the CAT NMS Plan is approved.¹⁹⁵⁹

For clock synchronization on exchanges, the Commission discussed in the Notice that exchanges trading NASDAQ securities currently adhere to clock synchronization standards at or below 100 microseconds, and the Commission understands that the NYSE, the options exchanges, and the SIAC SIP have comparable clock synchronization standards. In addition, the Commission noted that Participants stated “that absolute clock offset on exchanges averages 36 microseconds.”¹⁹⁶⁰

Also in the Notice, Commission Staff conducted an analysis of the frequency of order events using MIDAS data which identified whether for each order event, an event in the same security at another venue occurred within a given time range. 97.95% of order events for listed equities and 91% of order events for listed options occurred within one second of another unrelated order event in the same security. 14.44% of the unrelated order events for listed equities and 3.12% of the unrelated order events for listed options in the same security occurred within 5 microseconds of another order event in the same security. The Commission noted that the analysis underestimates the true frequency of unrelated events within the given time frames because it includes only order events that are included in the MIDAS data, and furthermore stated that the analysis illustrates how the current frequency of order events makes sequencing unrelated order events difficult. With respect to the granularity of timestamps, the Commission discussed in the Notice that regulators need sufficiently granular timestamps to sequence events across orders and within order lifecycles, and that the current lack of uniform and granular

¹⁹⁵⁹ Id. at 30683.

¹⁹⁶⁰ Id. at 30669.

timestamps can limit the ability of regulators to sequence events accurately and link data with information from other data sources.¹⁹⁶¹ In addition, the Commission discussed that current data sources have different timestamp granularity standards, and that many public data sources report time in seconds or milliseconds, and some, including direct data feeds, report time in microseconds or nanoseconds. As examples, the Commission stated that OPRA allows for timestamps in nanoseconds and that the other SIPs require timestamps in microseconds for equity trades and quotes, whereas the short sale transactional data released by exchanges contains timestamps in seconds.¹⁹⁶² In addition, the Commission stated that OATS requires timestamps in milliseconds for firms that capture time in milliseconds, but does not require members to capture time in milliseconds.¹⁹⁶³

One commenter discussed the Commission’s analysis of the frequency of order events in the context of the Commission’s baseline assessment of clock synchronization and timestamp granularity.¹⁹⁶⁴ The commenter pointed out that the Commission’s analysis “used primarily SIP data, reflecting exchange only recording of events, which is a tightly controlled, co-located and specialized environment” and that the analysis “does not reflect the broader broker-dealer communities’ recording of events ... in a distributed environment, a much less controlled and

¹⁹⁶¹ Id. at 30669–70.

¹⁹⁶² Id.

¹⁹⁶³ Id.

¹⁹⁶⁴ FIF Letter at 118.

less precise environment.”¹⁹⁶⁵ That commenter also stated that “[w]ithin every order lifecycle, the events leading up to the execution can be [sequenced] due to daisy chaining.”¹⁹⁶⁶

As noted above, commenters recognized that lower tolerances were already mandated by some exchanges as well as ATSS that maintain an order book.¹⁹⁶⁷ One commenter noted that some firms receive direct feeds from exchanges as precise as 1 microsecond.¹⁹⁶⁸ The Participants and another commenter explained that the marketplace is segmented such that broker-dealers operate under a different business model and regulatory environment than ATSS and exchanges.¹⁹⁶⁹ While microsecond tolerances for exchanges and ATSS are already standard practice, broker-dealers have no standard practice across the industry and are precluded from using matching engines, which are capable of the lowest level of granularity.¹⁹⁷⁰

One commenter noted the imprecise business process of handling manual orders.¹⁹⁷¹ Another commenter noted that manual intervention can take over a second because it involves several steps, which impact timestamp capture.¹⁹⁷²

The Participants’ response provided new information on the current clock synchronization standards of Participants.¹⁹⁷³ Specifically, the response clarified that all

¹⁹⁶⁵ FIF Letter at 118.

¹⁹⁶⁶ Id.

¹⁹⁶⁷ TR Letter at 7; FIF Letter at 97–99.

¹⁹⁶⁸ Better Markets Letter at 8.

¹⁹⁶⁹ Response Letter II at 4; FIF Letter 97–99, 116.

¹⁹⁷⁰ Id.

¹⁹⁷¹ FIF Letter at 118.

¹⁹⁷² SIFMA Letter at 35. Specifically, this commenter explained that manual order taking involves taking an order via phone, fax, or email and then manually entering the order into an electronic order management system.

Participants currently operate pursuant to a clock synchronization standard of 100 microseconds with regard to their electronic systems.¹⁹⁷⁴

The Commission has considered these comments and, as discussed below, has updated its analysis of the baseline of clock synchronization as set out in the Notice.

In the Notice, the Commission explained that its analysis of the frequency of order events used MIDAS data, recognized the limitations that its use of MIDAS data could impose, and explained how the limitations reflected the Commission's assessment of the baseline.¹⁹⁷⁵ The Commission therefore agrees with the commenter that its analysis reflects a disproportionate number of exchange events relative to off-exchange events. But because the commenter did not explain how the limitations of the Commission's analysis could make the analysis less useful or what statistical biases could result from these limitations, the Commission believes that, despite its limitations, the analysis "still provides useful insights" and "illustrates how the current frequency of order events makes sequencing unrelated order events difficult."¹⁹⁷⁶

The Commission generally agrees that events can be sequenced due to daisy chaining, but notes that for most regulatory activities,¹⁹⁷⁷ it is crucial for the regulators to be able to accurately sequence events from different orders. Furthermore, the Commission believes that such sequencing requires both sufficient clock synchronization across market participants and sufficiently granular timestamps.

¹⁹⁷³ Response Letter II at 4–5.

¹⁹⁷⁴ Id.

¹⁹⁷⁵ See Notice, supra note 5, at 30669.

¹⁹⁷⁶ Id.

¹⁹⁷⁷ Id. at 30667.

With respect to comments regarding manual orders, the Commission believes the new insights provided by commenters are consistent with the baseline in the Notice.

The Commission is updating its economic baseline to include the new information provided by the Participants and also to include the approval of a FINRA rule amendment. Specifically, the Commission now believes that all Participants currently operate pursuant to a clock synchronization standard of 100 microseconds. Also, the Commission approved the proposed rule change by FINRA that was discussed in the Notice that reduces the synchronization tolerance for computer clocks to 50 milliseconds for member firms that record events in NMS Securities.¹⁹⁷⁸ Accordingly, FINRA members that record events in NMS Securities currently operate, or in the near future will operate, pursuant to a clock synchronization standard of 50 milliseconds for their computer clocks.

C. Data Linking and Combining

Regarding data linking, as the Commission addressed in detail in the Notice, regulators analyzing an event or running a surveillance pattern often need to link data.¹⁹⁷⁹ As examples, the Commission stated that cross-market examinations require the cumbersome and time-consuming task of linking many different data sources; that regulators that are determining whether rule violations have occurred will combine trading data from sources such as public feeds, SRO audit trails, EBS data, and trade blotters; and that the analysis and reconstruction of market events could require linking many different data sources, such as a dozen SRO audit trails.¹⁹⁸⁰

¹⁹⁷⁸ See Securities Exchange Act Release No. 77565 (April 8, 2016), 81 FR 22136 (April 14, 2016).

¹⁹⁷⁹ Id. at 30670.

¹⁹⁸⁰ Id.

The Commission discussed that merging different data sources often involves translating the data sources into the same format, which can be a complex process that is prone to error.¹⁹⁸¹ In addition, the Commission discussed that linking records within or across data sources requires the sources to share “key fields” that facilitate linkage, but that regulators may be unable to link some data source combinations accurately because the data sources do not have key fields in common or the key fields are not sufficiently granular; also, different data sources may have key fields in common but the relationship between the fields is not straightforward so the algorithm to link them may be necessarily complex and not entirely successful.¹⁹⁸² Furthermore, the Commission discussed that within a single order lifecycle, the order number may change when a broker-dealer routes the order to another broker-dealer or exchange or even to another desk at the same broker-dealer. Finally, the Commission discussed that the inability to link all records affects the accuracy of the resulting data and can force an inefficient manual linkage process that would delay the completion of the data collection and analysis portion of an examination, investigation, or reconstruction.¹⁹⁸³

D. Customer and Broker-Dealer Identification

With respect to market participant identifiers (“MPIDs”), the Commission explained that trade and order data currently available to the Commission lack consistent customer and broker-dealer identifiers, which limit regulators’ ability to track the activity of one client or broker-dealer across the market.¹⁹⁸⁴ In the case of broker-dealers, the Commission stated that identifiers

¹⁹⁸¹ Id.

¹⁹⁸² Id.

¹⁹⁸³ Id.

¹⁹⁸⁴ Id. at 30670–71.

are inconsistent and that no centralized database exists. In addition, although SROs generally identify their members using MPIDs, those MPIDS are not standardized across venues.¹⁹⁸⁵ The Commission further stated that aggregating a broker-dealer’s activity across venues requires verifying the MPIDs assigned to a broker-dealer on each venue, usually referencing the broker-dealer by its Central Registration Depository (“CRD”) number. Finally, the Commission stated that in the course of manual data analysis, Commission Staff have experienced challenges in identifying broker-dealers using CRD numbers, but that the Commission and the SROs have generally overcome these challenges in the context of automated regulatory data analysis.

In the case of broker-dealer customers, the Commission stated that identifying customer account owners across multiple broker-dealers is difficult and prone to error.¹⁹⁸⁶ As an example, the Commission discussed that although the EBS system provides the names associated with each account traded, these names are drawn from separate records of each broker-dealer providing data to the EBS system, and the same party may be identified by a different name across multiple broker-dealers.

One commenter discussed the difficulty in tracking market participant activity using MPIDs, stating that “[w]ith regard to trade identifiers used by market access providers, some clearing firms have used one or more MPIDs to conceal the identity of other participants/clients using these services to manipulate markets.”¹⁹⁸⁷ The Commission agrees that tracking market participant activity using MPIDs can be difficult because of sponsored or direct market access arrangements whereby broker-dealers allow customers to trade electronically using the broker-

¹⁹⁸⁵ Id.

¹⁹⁸⁶ Id.

¹⁹⁸⁷ Anonymous Letter I at 12.

dealer's MPID. In cases where the sponsored or direct market access customer is not a FINRA member, the EBS system allows regulators to observe the identity of trading parties that may be concealed by MPIDs, but, as discussed in the Notice, it is difficult to consistently identify trading parties across multiple broker-dealers because they may use different names across these broker-dealers. In addition, as discussed in the Notice, EBS data is cumbersome to use for broad analysis because of fragmentation of the data.¹⁹⁸⁸ However, in cases where the sponsored or direct market access customer is a FINRA member, OATS reporting obligations require both the customer broker-dealer and the sponsoring broker-dealer to generate reports that, when linked correctly, allow regulators to observe the identity of the trading party.¹⁹⁸⁹

E. Aggregation

Regarding data aggregation, as addressed in detail in the Notice, the practice used in some data records of bundling together data from different orders and trades can make it difficult to distinguish the different orders and trades in a given bundle. That aggregation reduces the usefulness of equity and options cleared reports, because the reports do not have detailed trade information and do not include activity that does not require clearing.¹⁹⁹⁰ In the Notice, the Commission presented as an example the frequent use of average-price accounts by brokers to execute and aggregate multiple trades for one or more customers. The Commission discussed that for these cases, and with EBS data, the system does not reflect the details of each individual

¹⁹⁸⁸ See Notice, supra note 5, at 30661.

¹⁹⁸⁹ See OATS Compliance FAQ at C84 available at www.finra.org/industry/faq-oats-compliance-faq.

¹⁹⁹⁰ See Notice, supra note 5, at 30688–89.

trade execution.¹⁹⁹¹ Furthermore, the Commission discussed that information on trade allocations aggregate the trade information to such an extent that it is difficult for regulators to identify when particular clients may be afforded preferential treatment because it is challenging to link subaccount allocations to orders and trades.¹⁹⁹²

In addition, as the Commission discussed in the Notice, issuer repurchase information is aggregated at the monthly and quarterly level, and this level of aggregation limits the use of such data in investigations of the timing of issuer repurchases and issuer stock price manipulation and in analysis of the use of the Rule 10b-18 issuer repurchase safe harbor.

(3) Accessibility

As addressed in detail in the Notice, the SROs and the Commission also lack direct access—i.e., the ability to log into a system in a manner that would allow them to gather and analyze the data they need—to many of the data sources described above. SROs generally have direct access only to their own audit trails and the public data feeds.¹⁹⁹³ The Commission has direct access only to the public data feeds and the equity and option cleared data; it lacks direct access to information provided in EBS or contained in trade blotters, order tickets, order handling data, SRO audit trails, and OATS data.¹⁹⁹⁴

The Commission explained that if a regulator does not have direct access to data it needs, the regulator would request it, and that this can result in many burdensome requests to broker-dealers, SROs, and others. The Commission recognized that data requests could impose burdens

¹⁹⁹¹ Id. at 30671.

¹⁹⁹² Id.

¹⁹⁹³ FINRA does receive data from certain SROs on a daily basis and subsequently has direct access to that data. Id. at 30671 n.453.

¹⁹⁹⁴ Id. at 30671–72.

on the entities responding to the requests, in addition to the burden on the regulators making the requests. In particular, broker-dealers, investment advisers, and SROs responding to a data request must incur costs in order to produce, store, and transmit the data for the Commission or SRO.¹⁹⁹⁵

The Commission explained that, to complete just one analysis, regulators may need to request data from many different data providers because of fragmentation in the data. The Commission discussed the fact that fragmentation in trade and order data can take many forms. First, an analysis may require the same type of data from many market participants. For example, while ATSS and dealers report order events in equities to OATS, each of the 12 equities exchanges has its own audit trail. As a result, a market reconstruction for a single security may involve data requests to multiple exchanges as well as to FINRA.¹⁹⁹⁶

Second, the required data fields for an analysis may be reflected in different types of data. For example, for investigations that require tracing a single trade or a set of trades back to an investor or investors, regulators would first need to request data from the exchanges or market participants executing trades to find out which members, subscribers, or broker-dealers sent the orders that led to the executions. Then, regulators would need to ask the members, subscribers, and broker-dealers for information on the orders and repeat that process until they get to the broker-dealer who initiated the order to see the customer behind the order.¹⁹⁹⁷

Third, an analysis may require data on different products covered in separate data sources. For example, some regulatory activities require data on both equities and options. And

¹⁹⁹⁵ Id. at 30672.

¹⁹⁹⁶ Id.

¹⁹⁹⁷ Id.

because current data sources do not contain information regarding both equities and options, regulators needing data on both types of securities would need to make several data requests.¹⁹⁹⁸

As the Commission discussed in the Notice, data fragmentation also results in disparate requirements for industry members to record and report the same information in multiple formats. Because each SRO has its own data requirements, a market participant that is a member of multiple SROs may be required to report audit trail data in numerous formats and interact with multiple regulators in response to normal data queries.¹⁹⁹⁹

(4) Timeliness

As addressed in detail in the Notice, currently, obtaining trade and order data and converting the data into a form in which they can be analyzed can involve a significant delay from the time of a particular event of interest. In some cases the length of time from when an event occurs until regulators can use relevant data in an investigation or analysis can be weeks or months. This is especially true for trading data that includes customer information.²⁰⁰⁰

The Commission explained in the Notice that corrected FINRA OATS data may be available less than two weeks after an event and uncorrected data on T+1. In particular, FINRA members submit OATS data on a daily basis, submitting end-of-day files by 8:00 a.m. ET the following day or they are marked late by FINRA. FINRA acknowledges receipt of the data an

1998

Id.

1999

Id.

2000

Id. at 30673. The Commission noted that some of the data sources described above can be accessed by SROs and the Commission without significant delay. For example, SROs and the Commission have some real-time direct access to public data and, through MIDAS, the Commission has next-day direct access to analytics that are based on public data, such as volumes over various time horizons. Furthermore, the Commission noted that FINRA receives audit trail data from exchanges pursuant to Regulatory Services Agreements at the end of each trading day. Id.

hour after the member submits it, before running its validation process. FINRA then takes approximately four hours after acknowledging receipt of OATS data to determine if the data contain any syntax errors. In addition to the four hours needed to identify errors within a report, it takes another 24 hours for context checking, which identifies duplicates or secondary events without an originating event. Once a context rejection is available, the member has up to five business days to repair the rejection. Reports for files that contain internally inconsistent information about processing, linking, and routing orders may be available within two business days. FINRA attempts to match the inconsistent information against any additional data received up to T+2 for linking errors and T+3 for routing errors. The timing for surveillance programs varies depending on the type of surveillance being performed; data is assumed to be completely processed and corrected at T+8.²⁰⁰¹

The Commission also explained that because market participants generally do not report or compile datasets immediately after an order event, there is a delay before regulators may access some data sources. For example, the compilation of equity and option cleared reports occurs on T+1 for options and T+3 for equities (*i.e.*, the clearing day) and the electronic query access for equities is available from the Securities Information Automation Corporation (“SIAC”) on T+3. Additionally, when broker-dealers receive a request for EBS, the firm must first fill in the EBS report and then, if it does not self-clear, pass the reports on to its clearing firm to compile and send to SIAC. The EBS submission process can take up to ten business days. More immediate requests for cleared options data can be submitted to FINRA, but even this process takes up to two days. Because EBS data do not contain order entry time and order

²⁰⁰¹ Id.

execution time, regulators must obtain this information from firms and brokers using either data requests or subpoenas, and this process generally can take from two to four weeks depending on the size of the request.²⁰⁰²

In addition, the Commission noted that the lack of direct access to most data sources may further delay the ability of regulators to use data in certain cases. When regulators have direct access to a data source, the time needed to receive data is only the time it takes for a query to run. On the other hand, when regulators lack direct access, their data requests can consume significant time, including both the time required to put the request together and response times from the SROs, broker-dealers, and others producing the data. For example, obtaining complete responses from each broker-dealer for an EBS request can take days or weeks depending on the scope of the request. Likewise, responses from the Intermarket Surveillance Group (“ISG”) for SRO audit trail data can take days or weeks.²⁰⁰³ As the Commission discussed in the Notice, once regulators receive the requested data, the data often have to be processed into a form in which they can be analyzed. The Commission explained that it can take considerable time for regulators to combine data from different sources and link records from within or across data sources. Furthermore, the lack of consistency in format adds complexity to projects involving data from multiple data sources, even when the project does not involve linking of these different data.²⁰⁰⁴

²⁰⁰² Id. The Commission also noted that it has been the Commission’s experience that trade blotter data requests can take weeks or in excess of a month depending on the scope of the request and how accustomed the broker-dealer is with fulfilling such requests. Id.

²⁰⁰³ Id.

²⁰⁰⁴ Id.

The Commission further discussed that those who use regulatory data also typically take time to ensure the accuracy of the data. The Commission explained that when regulators question the accuracy of data, they often check several alternative sources until they are comfortable that their data are accurate. This checking of data accuracy and augmentation process adds time to an investigation or analysis.²⁰⁰⁵

E. Benefits

In the Notice, the Commission discussed its belief that the economic benefits of the CAT NMS Plan would come from any expanded or more efficient regulatory activities facilitated by improvements to the data regulators use.²⁰⁰⁶ This is because the Plan will create a new consolidated data source—CAT Data—that should replace the use of some current data sources for many regulatory activities. Therefore, the Benefits Section described how CAT Data compares to data regulators currently use for regulatory activities, how the CAT Data would improve regulatory activities, and how these improvements would benefit investors, market participants, and markets in general.²⁰⁰⁷

In the Notice, the Commission discussed its preliminary belief that the CAT NMS Plan would produce data that would improve on current data sources because CAT Data would result in regulators having direct access to consolidated audit trail data, which would in turn improve many of the regulatory activities discussed in the Baseline Section.²⁰⁰⁸ As summarized in Table 2, the Commission preliminarily concluded that the Plan would generate improvements in the

²⁰⁰⁵ Id. at 30674.

²⁰⁰⁶ Id.

²⁰⁰⁷ Id. at 30674–30708.

²⁰⁰⁸ Id. at 30674–77.

quality of data that regulators would have access to in the areas of completeness, accuracy, accessibility, and timeliness. The Commission discussed its preliminary belief that the improvements in the quality of regulatory data within these categories would significantly improve the ability of regulators to perform a wide range of regulatory activities, which would lead to benefits for investors and markets. In addition, the Commission preliminarily believed that certain provisions in the Plan—those related to future upgrades of the Central Repository, the promotion of the accuracy of CAT Data, the promotion of the timeliness of CAT Data, and the inclusion of specific governance provisions identified by the Commission in the Adopting Release for Rule 613—would increase the likelihood that the potential benefits of the CAT NMS Plan would be realized.

In the category of completeness, the Commission discussed its belief that the ability for regulators to access more material data elements from a consolidated source would enable regulators to more efficiently carry out investigations, examinations, and analyses because regulators could acquire data from a single source that they would otherwise need to compile from many data sources. In the category of accuracy, the Commission discussed its belief that the Plan would substantially improve data accuracy by requiring CAT Data to be collected, compiled, and stored in a uniform, linked format using consistent identifiers for customers and market participants. In the category of accessibility, the Commission discussed its belief that the Plan would substantially improve the access to data for regulators because the Plan requires regulators to have direct access to CAT Data and this direct access would dramatically reduce the hundreds of thousands of requests that regulators must make each year in order to obtain data, thus reducing the burden on the industry. Finally, in the category of timeliness, the Commission discussed its belief that the Plan, if approved as noticed, would significantly

improve the timeliness of data acquisition and use, which could improve the timeliness of regulatory actions that use data.

The Commission discussed its expectation that regulatory activities such as surveillance, investigations, examinations, analysis and reconstruction of market events, and analysis in support of rulemaking initiatives would benefit from improved data quality as part of CAT.²⁰⁰⁹ The Commission explained that data is essential to all of these regulatory activities, and therefore substantial improvements in the quality of the regulatory data should result in substantial improvements in the efficiency and effectiveness of these regulatory activities, which should translate into benefits to investors and markets. For example, improved data could lead to more effective and efficient surveillance that better protects investors and markets from violative behavior and facilitates more efficient and effective risk-based investigations and examinations that more effectively protect investors. The Commission stated that together, these improved activities could better deter violative behavior of market participants, which could improve market efficiency. Furthermore, this increase in directly accessible data should improve regulators' understanding of the markets, leading to more informed public policy decisions that better address market deficiencies to the benefit of investors and markets. The Commission also discussed the fact that the Plan lacked information regarding the details of certain elements of the Plan likely to affect the benefits of the Plan, primarily because many of those details had not yet been determined, which creates some uncertainty about the expected economic effects.²⁰¹⁰

The Commission has considered the comments it received regarding the likely benefits of the CAT NMS Plan and continues to believe that the CAT NMS Plan would generate

²⁰⁰⁹ Id. at 30675–76.

²⁰¹⁰ Id. at 30676.

improvements in the quality of data that regulators would have access to in the areas of completeness, accuracy, accessibility, and timeliness. The Commission also continues to believe that improvements in the quality of regulatory data within these categories would significantly improve the ability of regulators to perform a wide range of regulatory activities, which would lead to benefits for investors and markets. In addition, the Commission continues to believe that certain provisions in the Plan—those related to future upgrades of the Central Repository, the promotion of the accuracy of CAT Data, the promotion of the timeliness of CAT Data, and the inclusion of specific governance provisions identified by the Commission in the Adopting Release for Rule 613—increase the likelihood that the potential benefits of the CAT NMS Plan described below will be realized. As set out in more detail below, the Commission has taken into account the modifications that have been made to the Plan where they are relevant to the Commission’s analysis of the benefits of the Plan, and has updated its analysis accordingly.

Table 2

	Customer Identifier	Broker- Dealer Identifier	TimeStamp ²⁰¹¹	Allocation information	Order Display Information	Buy-to-Cover Indicator	Special Handling Instructions	Routing/Modification/Cancellation information	Entire Lifecycle	Direct Access for Regulators	Off-Exchange Activity ²⁰¹²	Timeliness of Data Compiling ²⁰¹³
OATS	No	Yes	Yes (majority in milliseconds but some in seconds)	No	Yes (for limit orders)	No	Yes (conditional)	Yes	Yes (before order reaches exchange) No (once order reaches exchange)	No (except FINRA). Access can take several weeks	Yes	Raw Data: T+1 Corrected Data: T+6
COATS	No	Yes	Yes	No	No	No	No	Yes	No	No (except SROs w/r/t their own members)	No	Reported same-day, but separate file transmitted at latest T+1
SRO Audit Trails	No	Yes	Yes (majority in milliseconds but some in seconds)	No	No	No	No	Yes	No (only once order reaches exchange)	No (except SROs w/r/t their own trails). Access can take several weeks	No	As soon as a trade is executed.
Equity and Option Cleared Reports	No	No	No	No	No	No	No	No	No	Yes	Yes	Equity: T+3 Option: T+1
Electronic Blue Sheets	Yes (but not always consistent across broker-dealers) ²⁰¹⁴	Yes (but not always consistent across broker-dealers)	Yes	No	No	No	No	No (except for certain cancellation information)	No	No. Access can take several weeks or months	Yes	10 business days after request is submitted
Trade Blotters/Order Tickets	Yes (but not always consistent across broker-dealers)	Yes (but not always consistent across broker-dealers)	Yes (can be requested, although not always reliable)	No	No	No	No	No	No	No. Access can take several days	Yes	Same-day
Trading and Order Handling System Data	Depends on the trader	Yes	Yes	No	No	No	No	Yes	Yes (except allocations)	No. Regulators must request this data (SEC asks for the data within 10 days)	Yes	Same-day
Public/ Proprietary Data	No	No	Yes (varied between seconds and microseconds)	No	No	No	No	Yes (except non-displayed orders)	No	Yes	Yes	Same-day
Data from Proposed CAT	Yes (613(c)(7)(i)(A))	Yes (613(c)(7)(i)(C))	Yes (milliseconds) (613(d))	Yes (613(c)(7)(vi))	Yes (613(c)(7)(i)(F))	Yes (613(c)(7)(i)(F))	Yes (613(c)(7)(i)(F))	Yes (613(c)(7)(ii))	Yes (613(j)(9))	Yes (SEC and SROs) (613(e)(2))	Yes (613(c)(2) and (3))	Raw Data: T+1 Corrected Data: T+3

²⁰¹¹ As proposed, the CAT NMS Plan also requires CAT Reporters to synchronize their time clocks to the time maintained by the NIST with an allowable drift of 50 milliseconds. See CAT NMS Plan, *supra* note 5, at Section 6.8. According to a survey conducted by the Financial Information Forum (FIF), 39% of responding broker-dealers currently synchronize their clocks with less precision than what is called for by the CAT NMS Plan. Thus, the CAT NMS Plan would also increase the accuracy of the timestamps used by certain broker-dealers. See FIF Clock Offset Survey, *supra* note 247.

²⁰¹² Off-exchange activity includes currently reportable events that are not handled by a registered securities exchange.

²⁰¹³ In this instance, “timeliness” refers to when the data are compiled at the source in question (e.g., when OATS receives data from reporting broker-dealers), *not* when they become available to regulators because that timeline can vary depending on the regulator in question. As shown in the “Direct Access for Regulators” column, it may still take several days, weeks, or months for regulators to be able to access the data. For example, while OATS reporters provide the data at T+1, the SEC must request OATS data in order to access it, which may take several days or weeks. This narrower definition of timeliness is not used throughout this economic analysis.

²⁰¹⁴ Guidance from FINRA indicates that broker-dealers must “identify the party to the trade” through EBS fields such as “Primary Party Identifier,” but that party may be another broker-dealer rather than the ultimate customer. See FINRA, Electronic Blue Sheet Submissions, FINRA and ISG Extend Effective Date for Certain Electronic Blue Sheet Data Elements, Regulatory Notice 12-47 (Oct. 2012), [available at https://www.finra.org/sites/default/files/NoticeDocument/p194655.pdf](https://www.finra.org/sites/default/files/NoticeDocument/p194655.pdf). Similarly, under the large trader rule, persons exercising “investment discretion” are reported through EBS, but in some cases such persons are investment advisers rather than their customers. See *supra* note 1912 and accompanying text (discussing the large trader rule).

1. Improvements in Data Qualities

Consistent with the Adopting Release, the Commission identified in the Notice four qualities of trade and order data that impact the effectiveness of core SRO and Commission regulatory efforts: accuracy, completeness, accessibility, and timeliness.²⁰¹⁵ In assessing the potential benefits of the CAT NMS Plan, the Commission’s economic analysis compared the data that would be available under the Plan to the trading and order data currently available to regulators.²⁰¹⁶ The Commission preliminarily believed that the Plan would improve data in terms of all four qualities, but that uncertainty remained as to the expected degree of improvement in some areas.²⁰¹⁷ The Commission has considered the comments received, the Participants’ response, and the modifications to the Plan, and continues to believe that the Plan will improve accuracy, completeness, accessibility, and timeliness of trade and order data relative to the Baseline, with some uncertainty as to the degree of improvement.

a. Completeness

In the Notice, the Commission discussed how the CAT NMS Plan, if approved, would result in regulators having direct access to a single data source that would be more complete than any current data source.²⁰¹⁸ The Commission discussed its belief that the CAT Data²⁰¹⁹ would be more complete than other data sources because, compared to existing SRO audit trails and other data sources, the CAT Data would contain data from a greater number of broker-dealers on

²⁰¹⁵ See Adopting Release, supra note 14, at 45727.

²⁰¹⁶ Changes in all four data qualities affect certain data-driven regulatory activities. The benefits of the Plan derive from the changes to these regulatory activities.

²⁰¹⁷ See Notice, supra note 5, at 30678.

²⁰¹⁸ Id. at 30678–81.

²⁰¹⁹ Id. at 30678.

more event types, products, and data fields. While some current data sources contain many of the elements that would be included in CAT Data, the Commission explained that CAT Data would consolidate that data into one source that would be much more complete than any existing source, and that CAT Data would also include some elements that are not available from any current data source. In the Commission’s view, having this data consolidated in a single source would provide numerous benefits.

(1) Events and Products

In the Notice, the Commission discussed the fact that the CAT Data would include events and products from all current SRO audit trails, combined into a single data source. In addition, it would include some off-exchange activity not captured on current SRO audit trails,²⁰²⁰ as well as proprietary orders originated by a trading desk in the ordinary course of a member’s market making activities (or “principal activity”),²⁰²¹ and information on equities, options and OTC Equity Securities.²⁰²²

²⁰²⁰ The Commission noted that SRO audit trails currently do not include the activity of firms that are not members of that SRO. And, currently only FINRA requires its members to report their off-exchange activity. While broker-dealers that trade off-exchange must be members of FINRA unless their activity fits the terms of the exemption in Rule 15b9-1, firms that qualify for the exemption in that rule and that are not FINRA members do not report their off-exchange activity to OATS. This exemption covers a large percentage of off-exchange activity. Broker-dealers that are not FINRA Members accounted for 48% of orders sent directly to ATSS in 2014, 40% in 2013, and 32% in 2012. Because all SROs are Participants in the Plan, under the Plan all broker-dealers with Reportable Events, including off-exchange, would be required to report the required CAT Data to the Central Repository. Id. at 30678–79.

²⁰²¹ Id. at Section IV.D.2.b(1)A.

²⁰²² “OTC Equity Security” is defined in the Plan as “any equity security, other than an NMS Security, subject to prompt last sale reporting rules of a registered national securities association and reported to one of such association’s equity trade reporting facilities.” Id. at 30679.

Four commenters believed that the CAT NMS Plan would result in a data source that is not complete enough and argued that CAT should be significantly expanded in scope to include additional event types, such as additional short selling information, clearing information, and ETF creation and redemption data; additional product types, such as stock index futures and options on index futures; or other types of regulatory submissions or metrics reports, such as CCAR/DFAST, TLAC, Volcker, Basel III, or BCBS-283.²⁰²³

The Commission recognizes that at least some of these expansions could potentially make CAT Data more complete and responds to each of the suggestions above in Section IV.D.4.f. At the same time, the Commission continues to believe that the CAT NMS Plan will result in regulators having direct access to a single data source that will be more complete than any current data source. Furthermore, the Commission continues to believe that the CAT Data will be more complete than other data sources because it will contain data from a greater number of broker-dealers on more event types and products when compared to existing SRO audit trails and other data sources.

(2) Data Fields

In the Notice, the Commission also explained that the Plan would consolidate, in a single source, fields that currently may not be available from all data sources, including some fields that are difficult for regulators to compile.²⁰²⁴ It discussed its belief that, in particular, the inclusion of consistent, unique customer information in the CAT Data represents a significant improvement over current SRO audit trails in terms of completeness because very few current

²⁰²³ Anonymous Letter at 6–9, 12–14, 17; Better Markets Letter at 7; Data Boiler Letter at 1, 10–13, 17–18, 31; CBOE Letter at 1–2.

²⁰²⁴ See Notice, supra note 5, at 30679–81.

data sources contain customer information, and those that do are limited in terms of the completeness and accuracy of this information, which significantly limits regulatory efficiency.²⁰²⁵ As proposed in the Notice, CAT Data would also include other data fields not available from current SRO audit trails, including allocation information such as allocation time, open/close information, Quote Sent Time,²⁰²⁶ and information on whether a Customer gave a modification or cancellation instruction. With respect to the rest of the data fields included in CAT Data, the Commission discussed the fact that certain of them are included in some or all current SRO audit trails but that no single current source contains all of them. For example, the inclusion of order display information (i.e., whether the size of the order is displayed or non-displayed) and special handling instructions in CAT Data improve completeness because they are not always mandatory in SRO audit trail data and therefore may not be consistently available without data requests to broker-dealers.

The Commission discussed its belief that, while the costs and benefits of including particular fields can change due to technological advances and/or changes in the nature of markets, the Plan contains provisions regarding periodic reviews and upgrades to CAT that could lead to proposing additional data fields that are deemed important.²⁰²⁷ In addition, the Commission noted that it had reviewed gap analyses that examine whether the CAT Data would

²⁰²⁵ Id. at Section IV.D.2.a(1) and Section IV.D.2.b.(1)b, supra. As discussed in the Notice, SRO audit trails typically do not provide customer information, but a recent FINRA rule change would require its members to report to OATS non-FINRA member customers who are broker-dealers.

²⁰²⁶ “Quote Sent Time” refers to the time that an Options Market Maker routes its quote, or any modification or cancellation thereof, to an exchange. Id. at 30755.

²⁰²⁷ See Notice, supra note 5, at Section IV.E.3.a for a discussion of adding new data fields and other requirements for upgrading the CAT Data after approval.

contain all important data elements in current data sources, and that the Commission identified some potential data gaps.²⁰²⁸ However, the Commission discussed the fact that the Plan provides that prior to the retirement of existing systems, CAT Data must contain data elements sufficient to ensure the same regulatory coverage provided by existing systems that are anticipated to be retired.²⁰²⁹ The Commission discussed its expectation that, therefore, any missing elements that are material to regulators would be incorporated into the CAT Data prior to the retirement of the systems that currently provide those data elements to regulators.

Three commenters questioned the benefits of timestamps in the Allocation Report.²⁰³⁰ One of the commenters stated that a requirement to report allocation time would be “divorced from the goals of CAT.”²⁰³¹ Similarly, another commenter noted that allocation time would not provide the regulatory completeness benefit that the Commission is seeking because one likely definition would not capture what regulators would want.²⁰³² This commenter further argued that if the main regulatory purpose of including allocation timestamps is to detect cherry-picking, there could be alternate approaches that achieve the same result using existing data fields.²⁰³³

²⁰²⁸ In the Notice, the Commission acknowledged that the Participants are continuing to study gaps between current regulatory data sources and the Plan as filed. See Notice, supra note 5, at 30680–81; see also SEC Rule 613 – Consolidated Audit Trail (CAT) OATS – CAT Gap Analysis and SEC Rule 613 – Consolidated Audit Trail (CAT) Revised EBS – CAT GAP Analysis, available at <http://www.catnmsplan.com/gapanalyses/index.html>.

²⁰²⁹ See Notice, supra note 5, at 30680–81.

²⁰³⁰ FSR Letter at 9; SIFMA Letter at 35; FIF Letter at 3–4, 11, 86–89.

²⁰³¹ SIFMA Letter at 35.

²⁰³² FIF Letter at 11.

²⁰³³ FIF Letter at 89.

Three commenters suggested that the open/close indicator for equities would be a new data field.²⁰³⁴ However, these comments did not address the benefits of the open/close indicator that the Commission discussed in the Notice.

One commenter discussed possible data gaps between CAT and current data sources.²⁰³⁵ The commenter indicated that the OATS-CAT Gap Analysis, published in May 2015, is out of date because it does not reflect changes that have been incorporated into OATS since 2015 including additional fields to accommodate the Tick Size Pilot and ATS Order Book Reporting. The commenter also argued that gaps between OATS and CAT may widen further if changes to OATS continue to be made without corresponding changes to the CAT Plan for the initial phase. Furthermore, the commenter noted that other regulatory systems may indirectly impact CAT reporting requirements; for example, recent NYSE changes to the Account Type Indicator will require EBS changes, which in turn impacts CAT.²⁰³⁶

In their response, the Participants agreed with the Commission's analysis in the Notice and expressed their belief that there are benefits associated with including time-stamps in the Allocation Report, including the detection of allocation fraud.²⁰³⁷ With respect to the open/close indicator, the Participants noted that this data field is not captured pursuant to current industry practices for equities or some options transactions.²⁰³⁸ The Participants also responded to the comment regarding the OATS-CAT Gap Analysis, stating that the gap analysis has been updated

²⁰³⁴ FIF Letter at 84; TR Letter at 9; SIFMA Letter at 25.

²⁰³⁵ FIF Letter at 28–29.

²⁰³⁶ FIF Letter at 29.

²⁰³⁷ Response Letter I at 37–38.

²⁰³⁸ Response Letter I at 21–22.

by including newly-added data fields in these duplicative systems, such as the new OATS data fields related to the Tick Size Pilot and ATS Order Book Reporting changes.²⁰³⁹

The Commission has considered the comments it received and the Participants' response regarding the potential benefits of the CAT NMS Plan in terms of data completeness. The Commission disagrees with the comments that allocation timestamps are outside the goal of CAT and that they will not provide the Commission with the regulatory benefit that it is seeking. As discussed in the Notice and below, the Commission believes that allocation time is an important data field because it is critical in investigations of violations such as market manipulation and cherry-picking, and because allocation time is currently more difficult to acquire than the other information on the Allocation Report.²⁰⁴⁰ The inclusion of this data field will improve the efficiency and efficacy of enforcement investigations for regulators, and this benefit is one of the goals of the CAT NMS Plan. With respect to the commenter who argued that alternate approaches that do not rely upon allocation timestamps can be used to detect cherry picking, the Commission notes that the commenter's example requires an allocation time.

Regarding the possibility of data gaps between CAT and current data sources, the Commission recognizes that there may be other gaps between current regulatory data sources and the Plan, in addition to those that the Commission mentioned in the Notice. The Commission also recognizes that the number and the scope of these gaps can change over time due to new regulatory developments. However, as discussed above, the Participants have stated that they have completed the gap analysis.²⁰⁴¹ As set out in the Notice (and discussed above),

²⁰³⁹ Response Letter II at 21.

²⁰⁴⁰ See Notice, supra note 5, at 30679; see also Section V.E.2.c(3), infra.

²⁰⁴¹ See Section IV.D.9, supra.

the Plan specifically provides that, prior to the retirement of existing systems, CAT Data must contain data elements sufficient to ensure the same regulatory coverage as the coverage provided by these systems. Therefore, the Commission continues to believe that any missing elements that are important to regulators would be incorporated into the CAT Data prior to the retirement of the systems that currently provide these data elements.

The Commission is updating its analysis of these benefits to recognize two modifications to the Plan. First, modifications to the Plan to require the reporting of LEIs for Customers and Industry Members in certain circumstances²⁰⁴² should result in regulators having access to more complete information identifying Customers and Industry Members. Second, the Plan has been modified to eliminate the requirement to report an open/close indicator for equities and Options Market Makers. The inclusion of this indicator for equities and Options Market Makers would have assisted regulators in determining when an investor was buying to cover a short sale in equities or identifying whether options market makers engage in aggressive risk-taking trading. Such information would have been useful in detecting certain market manipulations, violations of rules such as Rule 105, short sale marking rules, and Rule 204. The Commission now notes that, due to the elimination of the requirement to report an open/close indicator for equities and Option Market Makers as part of CAT, these benefits will no longer be realized. However, the Commission is approving the Plan with this modification for the reasons discussed in Section IV.D.4.c, above.

²⁰⁴² See Section IV.D.4.a.(4) and Section IV.D.4.b.(2), *supra*, for a description of the LEI reporting requirements in the Plan.

b. Accuracy

In the Notice, the Commission analyzed the expected effect of the CAT NMS Plan on the accuracy of data available to regulators.²⁰⁴³ The Commission preliminarily believed that the requirements in the CAT NMS Plan for collecting, consolidating, and storing the CAT Data in a uniform linked format, the use of consistent identifiers for Customers, and the focus on sequencing would promote data accuracy. However, in regard to certain Plan requirements, the Commission preliminarily believed that improvements in data accuracy would be limited. For example, the Commission discussed its belief that the proposed clock synchronization requirements in the Plan would only lead to modest improvements in the percentage of sequenceable order events.²⁰⁴⁴ Also, the Commission noted that the full extent of improvement that will result from the Plan was uncertain, because the Plan defers many decisions relevant to accuracy until the Plan Processor publishes the Technical Specifications and interpretations.²⁰⁴⁵

(1) Definitions

As previously stated, the Plan defers many decisions relevant to accuracy until the Plan Processor publishes the Technical Specifications and interpretations. In particular, the CAT NMS Plan specifies that the “Technical Specifications shall include a detailed description of . . . each data element, including permitted values, in any type of report submitted to the Central Repository”²⁰⁴⁶ and “the Plan Processor shall have sole discretion to amend and publish

²⁰⁴³ See Notice, supra note 5, at 30681–89.

²⁰⁴⁴ Id.

²⁰⁴⁵ See CAT NMS Plan, supra note 5, at Section 6.9.

²⁰⁴⁶ Id. at Section 6.9(b)(v).

interpretations regarding the Technical Specifications.”²⁰⁴⁷ In the Notice, the Commission explained that this leaves open precise definitions and parameters for the data fields to be included in CAT Data.²⁰⁴⁸ Nonetheless, the Commission discussed its preliminary belief that the Plan provides some procedural protections to mitigate this uncertainty and help promote accuracy. For example, the Plan requires that, at a minimum, the Technical Specifications be “consistent with [considerations and minimum standards discussed in] Appendices C and D,” and that the initial Technical Specifications and any Material Amendments thereto must be provided to the Operating Committee for approval by Supermajority Vote.²⁰⁴⁹ Further, all non-Material Amendments and all published interpretations must be provided to the Operating Committee in writing at least ten days before publication, and shall be deemed approved unless two or more unaffiliated Participants call the matter for a vote of the full Operating Committee.²⁰⁵⁰

²⁰⁴⁷ The CAT NMS Plan provides details regarding how the responsibility for these decisions would be shared between the Operating Committee and the Plan Processor, with the Plan Processor having responsibility for data definitions and interpretations. Id. at Section 6.9(c)(i).

²⁰⁴⁸ For example, the Completeness section in the Notice noted that the open/close indicator for equities does not exist in current data sources. See Notice, supra note 5, at 30681. The accuracy of the open/close indicator for equities would have been subject to Plan Processor discretion, because the Plan Processor would have had responsibility for defining the permitted values and interpreting when CAT Reporters would use such permitted values and the Plan Processor would not have had guidance from previous data sources on how to define or interpret such a field.

²⁰⁴⁹ See CAT NMS Plan, supra note 5, at Section 6.9(a). The Commission notes that the standards in Appendices C and D do not cover all decisions that would affect the accuracy of the data.

²⁰⁵⁰ Id. at Section 6.9(c)(i).

The Commission received comments about the lack of definitions for data fields in the Plan such as the open/close indicator,²⁰⁵¹ allocation time,²⁰⁵² account type,²⁰⁵³ and customer type.²⁰⁵⁴ Commenters argued that it is currently uncertain whether the Plan Processor will select definitions that are the most beneficial to regulators. For example, one commenter suggested that allocation time may be challenging to define, stating that “the industry does not have a standard business flow which consistently captures time at the same point in the allocation process.”²⁰⁵⁵ This commenter further pointed out that if allocation time is defined as the time the allocation is booked, “it will not provide the regulatory benefit expected by the SEC,” and provided an example of a way to detect allocation fraud using the time “when the allocation was submitted to move the shares into the intended subaccounts.”²⁰⁵⁶ The Participants responded to the comments regarding the definitions of allocation time, account type, and customer type by saying that the definitions will be addressed in the Technical Specifications.²⁰⁵⁷

The Commission has considered the comments and believes they are consistent with the Commission’s assessment in the Notice that leaving open precise definitions, parameters, and interpretations for the data fields to be included in CAT Data creates uncertainty about the full

²⁰⁵¹ FIF Letter at 85.

²⁰⁵² TR Letter at 9; FIF Letter at 86.

²⁰⁵³ TR Letter at 9.

²⁰⁵⁴ TR Letter at 9.

²⁰⁵⁵ FIF Letter at 86.

²⁰⁵⁶ FIF Letter at 86, 89.

²⁰⁵⁷ The Participants responded to the comments on open/close more generally by requesting that the Commission clarify that the open/close indicator should not apply to equities, and did not respond regarding the definition. As noted elsewhere, modifications to the Plan will remove the open/close indicator for equities. See Section IV.D.4.c, supra.

extent of improvements in data accuracy. The Commission is cognizant of the complexity of certain data fields, such as allocation time. These complexities mean that the accuracy of the data fields depends on Plan Processor discretion, because the Plan Processor would have responsibility for defining the permitted values and interpreting when CAT Reporters would use such permitted values, and sometimes would not have guidance from previous data sources on how to define or interpret such a field.²⁰⁵⁸ Although the Commission agrees that uncertainty exists in the selection of data definitions and that definitions ultimately selected may not promote accuracy as much as certain alternatives, as discussed in Section V.G.4.a.(2), the Commission continues to believe that the existing process trades off the need for certainty with the benefits of an efficient process going forward. Further, for reasons discussed above in Section IV.B. and below in Section V.E.3.d, the Commission continues to believe that the Plan provides some procedural protections to mitigate this uncertainty and help promote accuracy.

(2) Data Errors

In the Notice, the Commission discussed the fact that the CAT NMS Plan specifies a high-level process for handling errors that includes target Error Rates for data initially submitted by CAT Reporters and a correction process and timeline, but explained that it is difficult to conclude whether the Error Rates and processes in the CAT NMS Plan would constitute an accuracy improvement as compared to current data sources. Specifically, because the current OATS error rate is below 1% and the Plan states that 5% is an appropriate initial Error Rate, the Commission preliminarily believed that the initial percentage of errors in CAT would be higher

²⁰⁵⁸ See Notice, supra note 5, at n.537. While the Commission would ultimately be able to correct such misinterpretations, regulators may not detect such a misinterpretation until the misinterpretation harms an investigation, exam, or other analysis.

than the current percentage of errors in OATS, though the OATS error rate may not be directly comparable to the Error Rate in the Plan.²⁰⁵⁹ As discussed in the Notice, Error Rates for CAT Data may not be comparable to error rates in OATS because of the increased scope and level of linkages specified in the Plan and the new, large, and untested system.²⁰⁶⁰

In the Notice, the Commission also discussed that the Plan contains some uncertainty about the level of the maximum Error Rate because the initial 5% rate is subject to a quality assurance testing period and subject to change again before each new batch of CAT Reporters are brought online. The Commission noted that in time, the rate could be lowered, but it also could be raised.²⁰⁶¹ Finally, the Commission discussed that the Plan specifies an error correction process and indicates that practically all errors identifiable by the validations used would be corrected by 8:00 a.m. ET on T+5, but that the Plan does not provide the level of detail necessary to verify whether the CAT validation process would run the same validations as OATS, whether current validations would be relevant, and what validations, if any, would be added.²⁰⁶²

Although the Commission received several letters regarding data error rates,²⁰⁶³ only a few letters discussed the effect of Error Rates on the accuracy of CAT Data.²⁰⁶⁴ While supporting the goal of a “de minimis” post correction error rate, one commenter suggested that the errors in CAT Data would not be “de minimis” even after the error correction process

²⁰⁵⁹ Id. at 30681–82.

²⁰⁶⁰ Id.

²⁰⁶¹ Id.

²⁰⁶² Id.

²⁰⁶³ See Section IV.D.11, supra for a complete summary of comments and the Commission’s discussion of those comments. Further, the Commission responds to comments relevant to alternatives that would reduce error rates below in Section V.H.2, infra.

²⁰⁶⁴ FIF Letter at 50–60; Anonymous Letter II at 2; SIFMA Letter at 6.

because OATS currently does not achieve “de minimis” errors.²⁰⁶⁵ For example, this commenter stated that there are instances where errors cannot be corrected in OATS and gave true duplicates and non-reportable symbols as examples.²⁰⁶⁶ The commenter stated that it is unreasonable to expect CAT Data to be any different than OATS data, especially because the industry has no experience with reporting and error correcting the new data types required by the Plan.²⁰⁶⁷ Another commenter expanded on this concern by questioning why accuracy problems persist in OATS today and argued that the improvements to accuracy from the Plan depend on eliminating the inaccurate/problematic reporting that exists today.²⁰⁶⁸

Other commenters expressed uncertainty regarding whether CAT Reporters would be able to achieve the initial Error Rate of 5%.²⁰⁶⁹ One commenter indicated that there is not enough information at this time to assess the Error Rate and that “Error Rate” is not specifically defined.²⁰⁷⁰ Another commenter echoed this sentiment saying that there is no history of reporting error rates for options, market making, customer information, or allocations and the Plan provides “little or no information ... regarding the types of errors that will be identified, and if and how those errors can be corrected.”²⁰⁷¹ The commenter also cited uncertainties related to

²⁰⁶⁵ FIF Letter at 60.

²⁰⁶⁶ FIF Letter at 55.

²⁰⁶⁷ FIF Letter at 60.

²⁰⁶⁸ Anonymous Letter II at 2.

²⁰⁶⁹ FIF Letter at 50; SIFMA Letter at 6.

²⁰⁷⁰ SIFMA Letter at 6.

²⁰⁷¹ FIF Letter at 50.

the inexperience of some CAT Reporters, unknown interfaces, a lack of information on test tools and correction tool kits, and an unknown linkage logic.²⁰⁷²

Finally, one commenter agreed with the Commission’s analysis that OATS error rates may not be directly comparable to a CAT Error Rate.²⁰⁷³ In particular, this commenter stated that OATS would be a sufficient comparison base for equities data only, but not for options, allocations, Customer Information, or market making reporting.

In response to the comments on uncertainty in the definition of Error Rate, the Participants disagreed, pointing to the current definition in the Plan and in Rule 613(j)(6).²⁰⁷⁴ The Participants further stated that they intend to keep the definition of Error Rate the same as in Rule 613 and noted that it is the Compliance Thresholds²⁰⁷⁵ that relate to the CAT reporting performance of individual CAT Reporters. In response to commenters expressing uncertainty about the ability to achieve the Error Rates, the Participants explained that they performed a detailed analysis that not only considered current and historical OATS error rates, but also considered the magnitude of the new reporting requirements and the fact that many CAT Reporters had never previously been obligated to report data for audit trail purposes.²⁰⁷⁶ The Participants, however, acknowledged that actual experience with CAT itself will provide more

²⁰⁷² FIF Letter at 50.

²⁰⁷³ FIF Letter at 55.

²⁰⁷⁴ Response Letter I at 45.

²⁰⁷⁵ The Error Rate reports shall include each of the following—if the Operating Committee deems them necessary or advisable—“Error Rates by day and by delta over time, and Compliance Thresholds by CAT Reporter, by Reportable Event, by age before resolution, by symbol, by symbol type (e.g., ETF and Index) and by event time (by hour and cumulative on the hour)[.]” See CAT NMS Plan, supra note 5, at Section 6.1(o)(v).

²⁰⁷⁶ Response Letter I at 46.

accurate and applicable data for determining the appropriate Error Rate and pointed out that the Plan provides for various opportunities for the Error Rate to be reevaluated and reset.²⁰⁷⁷

The Commission has considered the comment letters received and the Participants' response and continues to believe that it is difficult to determine whether the Error Rates and processes in the Plan would constitute an accuracy improvement compared to current data. The Commission recognizes the uncertainty regarding the ability to achieve a "de minimis" post-correction Error Rate discussed by a commenter and notes that post-correction errors are the ones more pertinent to the accuracy of data used in regulatory activities. While the Commission is concerned with the effect of the post-correction Error Rate on accuracy, it notes that, while uncertain, the Plan does require the Plan Processor to perform validations within three specific categories: File Validations (confirmation that the file is received in the correct format); Validation of CAT Data (checks of format, data type, consistency, range/logic, data validity, completeness, and timeliness); and Linkage Validation (checking the "daisy chain").²⁰⁷⁸ Specifically, in regard to Linkage Validation, the Plan seems to require validations that are more comprehensive than what FINRA runs on OATS data, where, as stated in the Notice, significant error rates in event linking are common because there is no cross-participant error resolution process.²⁰⁷⁹ Further, the OATS error types described in the Baseline above²⁰⁸⁰ also suggest that the Plan's validations will be more comprehensive than the validations run on OATS data.

²⁰⁷⁷ Response Letter I at 46.

²⁰⁷⁸ See CAT NMS Plan, supra note 5, at Appendix D, Section 7.2.

²⁰⁷⁹ See Notice, supra note 5, at 30667.

²⁰⁸⁰ See Section V.D.2.b(2)A, supra, which lists error types as rejects, unmatched exchange routes, inter firm received unmatched, inter-firm sent unmatched, out of sequence, and late reports.

The Commission agrees with the commenters that expressed uncertainty about whether CAT would be able to achieve the 5% initial Error Rate, but also agrees with the Participants' response. In the Participants' analysis, the Participants considered the magnitude of the new reporting requirements and the fact that many CAT Reporters had never previously been obligated to report data for an audit trail when they set the initial Error Rate. Furthermore, as mentioned in the Notice, the Plan provides for various opportunities for the Error Rate to be reevaluated and reset after CAT Reporters have more experience with CAT.²⁰⁸¹

Finally, the Commission agrees with the comment that OATS error rates may not be comparable to a CAT Error Rate because there is currently no reporting regime comparable to OATS for options, allocations, Customer Information, or market making reporting. In the Notice, the Commission discussed uncertainty in comparing OATS error rates to CAT Error Rates due, in part, to the increased scope of the CAT NMS Plan.²⁰⁸²

(3) Event Sequencing

A. Timestamp Granularity

In the Notice, the Commission discussed its preliminary belief that the minimum timestamp granularity required by the Plan would result in some improvement in data accuracy, but that the level of improvement could be limited. The CAT NMS Plan requires timestamps to the millisecond.²⁰⁸³ This is consistent with Rule 613, which requires timestamps to reflect

²⁰⁸¹ Id. at 30682.

²⁰⁸² Id.

²⁰⁸³ See CAT NMS Plan, supra note 5, at Section 6.8(b).

current industry standards and be at least to the millisecond.²⁰⁸⁴ Further, pursuant to Rule 613, if a CAT Reporter's system already utilizes timestamps in increments less than the minimum required by the Plan, the CAT Reporter must record timestamps in such finer increments.²⁰⁸⁵

As the Commission discussed in the Notice, many of the systems from which regulators currently obtain data already capture timestamps in increments of milliseconds or less, meaning that there would be no improvement in timestamp granularity as compared to those systems.²⁰⁸⁶ However, to the extent that some current data sources report timestamps in increments coarser than a millisecond, which is the case for 12% of OATS records and all EBS records,²⁰⁸⁷ the Commission noted that it expected the CAT millisecond timestamp requirement to improve data granularity, and thereby allow regulators to more accurately determine the sequence of market events relative to surrounding events. However, the Commission also explained that the benefits from the more granular timestamps could be limited by the level of clock synchronization required by the Plan. In particular, the Commission explained that timestamp granularity would not be the limiting factor in sequencing accuracy, because recording events with timestamps with resolutions of less than one millisecond cannot help to sequence events occurring on different

²⁰⁸⁴ 17 CFR 242.613(d)(3). This requirement does not apply to certain Manual Order Events, which are exempted from the requirement and are captured at one-second increments. Timestamp granularity on Manual Order Events is discussed separately in the Alternatives section.

²⁰⁸⁵ Id.

²⁰⁸⁶ For example, OPRA allows for timestamps in nanoseconds, and the other SIPs require timestamps in microseconds for equity trades and quotes. See Notice, supra note 5, at Section IV.D.2.b.(2).

²⁰⁸⁷ Current OATS rules require timestamps to be expressed to the nearest second, unless the member's system expresses time in finer increments. As of September 2014, approximately 12% of OATS records contain timestamps greater than one millisecond. EBS records either do not contain times or express timestamps in seconds. Id.

venues with clocks that may be 100 milliseconds out of sync due to clock synchronization offsets.²⁰⁸⁸ Therefore, the benefits of timestamping order events at increments finer than a millisecond would be limited without also improving the clock synchronization standards of the Plan.

The Commission discussed the benefits of the one second timestamp on manual orders and stated that it preliminarily believed that timestamp granularity of one second would be appropriate for manual orders, rather than a millisecond granularity, because recording Manual Order Events at the millisecond level would be ultimately arbitrary or imprecise due to human interaction.²⁰⁸⁹

Two commenters thought that a millisecond timestamp would be sufficient to achieve improvements in event sequencing.²⁰⁹⁰ One of these commenters suggested that requiring timestamps that are more granular than one millisecond for CAT Reporters who capture timestamps more granular than a millisecond would not yield regulatory benefits as it will result in a false sense of accuracy on event sequencing.²⁰⁹¹ An additional commenter did not support this requirement, stating that it would be inequitable and would not serve a regulatory

²⁰⁸⁸ For example, under the requirements in the Plan, an order event at Broker-Dealer A could have a timestamp that is 1 millisecond sooner than an order event at Broker-Dealer B even if the event at Broker-Dealer B actually occurred 99 milliseconds sooner. This could occur if Broker-Dealer A's systems are recording times 50 milliseconds ahead of NIST while Broker-Dealer B's systems are recording times 50 milliseconds behind NIST. Both broker-dealers' systems would be within the Plan's allowable clock synchronization tolerance.

²⁰⁸⁹ See Notice, *supra* note 5, at 30684.

²⁰⁹⁰ FIF Letter at 112; Data Boiler Letter at 21.

²⁰⁹¹ FIF Letter at 12.

purpose.²⁰⁹² On the other hand, two commenters supported the requirement that CAT Reporters report sub-millisecond timestamps if they capture them.²⁰⁹³ One commenter stated their belief that timestamp granularity “should go hand-in-hand with how fast a market participant is allowed to conduct their HFT activities.”²⁰⁹⁴ The other commenter stated that a “significant portion of today’s trades occur at microsecond intervals,” and that the Plan’s timestamp resolution “will be insufficient to show the precise time of the reportable activities.”²⁰⁹⁵ The commenter further stated that “[f]or some practices, such as cancellations, stuffing, and other “noisy” behaviors, the Plan should “require a more precise granularity to more comprehensibly and accurately capture the frequency and scale of such practices.”²⁰⁹⁶ One commenter stated their belief that stricter tolerances for the granularity of timestamps are already in effect at exchanges and ATSS that maintain an orderbook and did not believe it necessary to mandate timestamp tolerances for these entities since they already adhere to stricter tolerances for commercial reasons.²⁰⁹⁷

Two commenters indicated that timestamp granularity and clock-offset tolerance for allocation timestamps should be at one second.²⁰⁹⁸ One commenter argued that the benefits of

²⁰⁹² SIFMA Letter at 35.

²⁰⁹³ Data Boiler Letter at 21; Better Markets Letter at 8.

²⁰⁹⁴ Data Boiler Letter at 21.

²⁰⁹⁵ Better Markets Letter at 8.

²⁰⁹⁶ Better Markets Letter at 8.

²⁰⁹⁷ TR Letter at 7

²⁰⁹⁸ SIFMA Letter at 35; FIF Letter at 87, 89.

allocation time would not require millisecond precision while three commenters argued that allocations are not time-critical.²⁰⁹⁹

One commenter expressed that the irregularity in manual orders made it difficult to set a tolerance applicable to all manual orders and suggested that initially a timestamp tolerance of more than one second be allowed for manual orders.²¹⁰⁰ However, several other commenters stated that one second is a reasonable standard for manual orders.²¹⁰¹

In their response, the Participants stated their belief that CAT Reporters should be required “to report timestamps to the CAT at the granularity at which they are captured, even if that is more granular than that required by the Plan.” They further stated their belief that capturing such granularity would increase the quality of data reported to the CAT.²¹⁰² With respect to the timestamps on Allocation Reports, the Participants recognized the practical issues raised by requiring timestamps for Allocation Reports and proposed to amend the Plan to permit CAT Reporters to report allocation timestamps with a granularity of one second.²¹⁰³ With respect to manual order timestamps, the Participants stated that they continued to believe their proposed approach to Manual Order Events is appropriate.²¹⁰⁴

²⁰⁹⁹ FSR Letter at 9; SIFMA Letter at 35; FIF Letter at 89.

²¹⁰⁰ Data Boiler Letter at 21–22.

²¹⁰¹ FIF Letter at 115; SIFMA Letter at 34; Better Markets Letter at 8; Response Letter I at 38. However, Better Markets expressed the concern that gaming of the system could occur by writing algorithms to make automated orders appear as manual orders.

²¹⁰² Response Letter I at 28.

²¹⁰³ Response Letter I at 37.

²¹⁰⁴ Response Letter I at 38.

The Commission has considered the comment letters received and the Participants' response, and as discussed in more detail above,²¹⁰⁵ has amended the Plan so that Participants are required to adhere to a more stringent clock synchronization standard of 100 microseconds and allocation timestamps need only be reported in seconds instead of milliseconds. The Commission is updating its economic analysis to incorporate these modifications to the Plan. The Commission agrees with the commenter who pointed out that millisecond timestamps are insufficient to show the precise timestamp of certain activities and disagrees with commenters who stated that millisecond precision is sufficient to sequence events. As stated in the Notice, the Commission believes that a 1 millisecond timestamp granularity offers benefits over the Baseline, but that a more granular timestamp requirement, coupled with a more stringent clock synchronization requirement, would be needed to completely sequence the majority of unrelated market events. In response to the commenters who questioned the benefits of reporting the sub-millisecond timestamps if CAT Reporters capture them, the Commission agrees with the Participants that such a requirement will increase the quality of data reported to the CAT.

Modifications to the Plan now require Participants to adhere to a more stringent clock synchronization standard of 100 microseconds (or less), and CAT Reporters to record timestamps in finer increments than 1 millisecond if their systems utilize timestamps in such finer increments. Because, as discussed above,²¹⁰⁶ Participants already operate pursuant to a clock synchronization standard of 100 microseconds with regard to their electronic systems, and because many Participants already report timestamps in microseconds and nanoseconds in their direct feeds and are currently required to report timestamps in microseconds for equity trades and

²¹⁰⁵ See Section IV.D.13, supra.

²¹⁰⁶ See Section IV.D.13.a(1), supra.

quotes, the Commission does not believe the clock synchronization amendment to the Plan will result in large accuracy improvements over current standards for timestamp granularity.

However, the Commission is approving the Plan without further modifications for the reasons discussed in Section IV.D.13, above.

In the Notice, the Commission did not explicitly consider timestamp granularity or clock synchronization standards for timestamps in Allocation Reports. However, in response to comments and modifications to the timestamp on Allocation Reports, the Commission now analyzes whether the modifications limit the improvements to accuracy. Based on the experience of its Staff, the Commission understands that allocations are conducted after a trade and that the allocation time can aid regulators in ways that do not require millisecond-level timestamps (or 50 millisecond clock offset tolerance). Further, the Commission agrees with the commenter's argument that allocations are not time-sensitive and the benefits from allocation timestamps do not require millisecond precision. Therefore, the Commission believes that requiring allocation times to be recorded in milliseconds (with 50 millisecond offset tolerance) compared to seconds (with one second tolerance) would provide little, if any, additional regulatory benefit. Therefore, the Commission does not believe that this modification materially reduces the improvements to accuracy.

B. Clock Synchronization

In the Notice, the Commission discussed its belief that the clock synchronization standards in the CAT NMS Plan are reasonably designed to improve the accuracy of market activity sequencing, but that the improvements to the percentage of sequenceable order events by Plan standards are modest and the requirements of the Plan may not be sufficient to completely sequence the majority of market events relative to all other events. In particular, the Commission conducted an analysis using MIDAS data that found that the current FINRA one-

second clock offset tolerance allows only an estimated 1.31% of unrelated order events²¹⁰⁷ for listed equities and 6.97% of unrelated order events for listed options to be sequenced.²¹⁰⁸ By comparison, the proposed 50 millisecond clock offset tolerance could accurately sequence an estimated 7.84% of unrelated order events for listed equities and 18.83% of unrelated order events for listed options.²¹⁰⁹ Also, by comparison, the analysis found that a 100 microsecond clock offset tolerance, if applied to all reporters, could accurately sequence an estimated 42.47% of unrelated order events for listed equities and 78.42% of unrelated order events for listed options.²¹¹⁰ In the Notice, the Commission discussed its preliminary belief that the analysis suggests the standards required by the Plan do represent an improvement over the current standard but that the majority of unrelated market events would remain impossible to sequence based on the Plan's required clock synchronization standards.²¹¹¹

The Commission also discussed in the Notice that, independent of the potential time clock synchronization benefits, order linking data captured in CAT should increase the

²¹⁰⁷ See Notice, supra note 5, at 30669 for a definition of unrelated order events as it relates to this analysis and the analysis described there.

²¹⁰⁸ Id. at 30683. The Commission discussed that these estimates were upwardly biased.

²¹⁰⁹ Id. The Commission discussed that these estimates were upwardly biased.

²¹¹⁰ A 100 microsecond clock offset tolerance will now be required of Participants due to an amendment to the Plan.

²¹¹¹ The Commission noted that the Plan itself states “[f]or unrelated events, e.g., multiple unrelated orders from different broker-dealers, there would be no way to definitively sequence order events within the allowable clock drift as defined in Article 6.8,” and that this limitation “in turn limits the benefits of CAT in regulatory activities that require event sequencing, such as the analysis and reconstruction of market events, as well as market analysis and research in support of policy decisions, in addition to examinations, enforcement investigations, cross-market surveillance, and other enforcement functions.” See Notice, supra note 5, at 30683.

proportion of order events that are accurately sequenced.²¹¹² This is because some records pertaining to the same order can be sequenced by their placement in an order lifecycle (e.g., an order submission must have occurred before its execution) without relying on timestamps.

Although the Commission received several comment letters related to clock synchronization, which are discussed in detail in Section IV.D.13.a above, only two letters commented on the effects of clock synchronization standards on event sequencing.²¹¹³ Both commenters agreed with the Commission’s assessment that provisions in the CAT NMS Plan related to event sequencing would provide improvements in accuracy compared to what is currently achievable.²¹¹⁴ However, one of these commenters further stated their belief that unrelated events may not be sequenceable and stated that it is unclear what the regulatory relevance is of sequencing unrelated events across market centers.²¹¹⁵ The commenter went on to say that there was no evidence that lower clock synchronization tolerances would increase the accuracy of the audit trail;²¹¹⁶ however, the commenter also stated that “more precise timestamps provided by exchanges may be of benefit to the audit trail as corroborating evidence when sequencing events that terminate at an exchange.”²¹¹⁷

The Commission has considered the comment letters received, the Participants’ response, and amendments to the Plan. As explained below, the Commission continues to believe that requirements in the Plan related to event sequencing would provide improvements in accuracy

²¹¹² See Notice, supra note 5, at n. 555.

²¹¹³ FIF Letter at 97–111; Data Boiler Letter at 31.

²¹¹⁴ FIF Letter at 101; Data Boiler Letter at 31.

²¹¹⁵ FIF Letter at 101.

²¹¹⁶ FIF Letter at 111.

²¹¹⁷ FIF Letter at 98.

compared to what is currently achievable, but that improvements are modest and the requirements to the Plan may not be sufficient to completely sequence the majority of market events relative to all other events. Orders sent from different broker-dealers to different CAT Reporters can only be sequenced in CAT Data according to their timestamp. If the clocks of CAT Reporters are not synchronized with sufficient precision, it is impossible to definitively sequence these events. The Plan acknowledges this limitation and states, “[f]or unrelated events, e.g., multiple unrelated orders from different broker-dealers, there would be no way to definitively sequence order events within the allowable clock drift as defined in Article 6.8.”²¹¹⁸

The Commission disagrees with the comment that sequencing unrelated market events has no regulatory relevance. As discussed in the Notice, the ability to sequence market events is crucial to the efficacy of detecting and investigating some types of manipulation, particularly those involving high frequency trading, those in liquid stocks in which many order events can occur within microseconds, and those involving orders spread across various markets. The Commission also disagrees with this commenter’s assessment that more stringent clock synchronization standards would not increase the accuracy of the audit trail. As demonstrated by the Commission’s analysis in the Notice, if clock synchronization standards were made more stringent, some of the many market events at separate market centers that occur within small time windows would become sequenceable, which would increase the accuracy of the audit trail.

As discussed in more detail above,²¹¹⁹ the Commission has amended the Plan so that Participants are required to adhere to a more stringent clock synchronization standard of 100 microseconds with regard to electronic systems, excluding certain manual systems. In the

²¹¹⁸ See CAT NMS Plan, supra note 5, at Appendix C-25.

²¹¹⁹ See Section IV.D.13, supra.

Participants' response, they noted that all Participants currently operate pursuant to a clock synchronization standard of 100 microseconds with regard to their electronic systems, so that the amended requirement is already met by the Participants.²¹²⁰ In addition, as discussed in more detail above,²¹²¹ the Commission has approved a proposed rule change by FINRA that reduces the synchronization tolerance for computer clocks of firms that record events in NMS Securities to 50 milliseconds.²¹²² Because broker-dealers that are FINRA members are currently required to adhere to a clock synchronization standard of 50 milliseconds, and because Participants already adhere to a clock synchronization standard of 100 microseconds, the Commission does not believe the 50 millisecond clock synchronization requirement of CAT Reporters and the more stringent clock synchronization requirement of 100 microseconds for Participants, as specified in the amended Plan, would substantially change the ability of regulators to accurately sequence unrelated market events over what is currently achievable using timestamps alone.²¹²³

²¹²⁰ Response Letter II at 4–5.

²¹²¹ See Section IV.D.13.a(1), supra.

²¹²² See Securities Exchange Act Release No. 77565 (April 8, 2016), 81 FR 22136 (April 14, 2016).

²¹²³ Although not currently required in the Plan, the Commission believes there would be additional benefit to event sequencing if off-exchange execution venues, including alternative trading systems and broker-dealer internalizers, were required to adhere to a more stringent clock synchronization standard. As discussed in Section IV.D.13.a, the Commission understands that certain Industry Members, such as ATs and broker-dealers that internalize off-exchange order flow, today adhere to a finer clock synchronization standard. As the Participants conduct their annual reviews, the Commission expects them to consider proposing new clock synchronization standards whenever they determine the industry standard for CAT Reporters, or certain categories or systems thereof, has become more granular than required by the Plan at that time. In determining the appropriate industry standards for clock synchronization, the Commission has amended the Plan so that the SROs should apply industry standards based on the type of CAT Reporter or system, rather than the industry as a whole. Varied requirements would segment the broker-dealer community, and one commenter stated a

However, the Commission is approving the Plan without further modifications for the reasons discussed in Section IV.D.13, above. Further, to the extent CAT captures more events than are currently captured, such as CAT Reportable Events by broker-dealers that are not FINRA members (see Section V.E.1.a.(1)), regulators will be able to accurately sequence a proportion of those events, which will increase the overall number of sequenced events.²¹²⁴ In addition, the Commission continues to believe that, independent of the potential clock synchronization benefits, the order linking data that would be captured by the CAT should increase the proportion of events that could be sequenced accurately.²¹²⁵

(4) Linking and Combining Data

In the Notice, the Commission discussed its preliminary belief that the requirements of Rule 613 and the Plan related to data linking would result in improvements to the accuracy of the data available to regulators, but the extent of the improvement would depend on the accuracy of the linking algorithm and the reformatting process that the Plan Processor would eventually develop. Specifically, the Commission discussed its belief that the requirement that data be stored in a uniform format would eliminate the need for regulators to reformat the data, and that

desire to “avoid unnecessary market segmentation” with regard to clock synchronization. See FSR Letter at 8. See also Section IV.D.13.a(1), supra. The Commission notes, however, that these venues are already segmented with respect to their position within the broker-dealer and also with respect to other broker-dealers that do not provide these services.

²¹²⁴ Note that broker-dealers that are not FINRA members are not subject to FINRA’s clock synchronization requirements and do not submit reports to OATS. Currently, their activity, to the extent it is captured, is captured and timestamped by exchanges and other FINRA members that receive their orders.

²¹²⁵ As discussed in the Notice, this reflects the fact that some records pertaining to the same order could be sequenced by their placement in an order without relying on timestamps. This information may also be used to partially sequence surrounding events. See Notice, supra note 5, at n.555.

storing data in a linked format removes the need for regulators to link information from multiple lifecycle events of an order or orders themselves, which could further reduce errors and increase the usability of the data. Furthermore, the Commission discussed its belief that the Plan would significantly improve the ability of regulators to link order events compared to OATS, and would link this activity to specific customers, unlike current audit trail data. However, the Commission also noted that the CAT NMS Plan does not provide sufficiently detailed information for the Commission to estimate the likely error rates associated with the linking process required by the CAT NMS Plan.²¹²⁶ Accordingly, while the centralized linking should generally promote efficiencies and accuracies, the Commission stated that these uncertainties make it difficult to gauge the degree to which the process for linking orders across market participants and SROs would improve accuracy compared to existing data, including OATS.²¹²⁷

The Commission also explained that uncertainties prevented it from determining whether the process for converting data into a uniform format at the Central Repository would improve the accuracy of the data over existing audit trail accuracy rates.²¹²⁸ The Plan includes two

²¹²⁶ While the 5% Error Rate covers data from CAT Reporters, the Plan Processor could create errors as well, for example, through the linking process. Further, the Plan does not include details on how the Plan Processor would perform the linking process, identify broken linkages, and seek corrected reports from CAT Reporters to correct broken linkages. Instead, the Plan defers key decisions regarding the validation process until the selection of a Plan Processor and the development of Technical Specifications. The CAT NMS Plan describes the Plan Processor's responsibility for creating the Technical Specifications. See CAT NMS Plan, supra note 5, at Section 6.9.

²¹²⁷ The Commission notes that the Plan Processor is required to create a quality assurance testing environment in which, during industry-wide testing, the Plan Processor provides linkage processing of data submitted, the results of which are reported back to Participants and to the Operating Committee for review. Id. at Appendix D, Section 1.2. This may help identify challenges in the linking process and allow for their early resolution.

²¹²⁸ See Notice, supra note 5, at 30686.

alternative approaches to data conversion. In the first, called Approach 1, CAT Reporters would submit data to the Central Repository in an existing industry standard protocol of their choice such as the Financial Information eXchange (“FIX”) protocol. In Approach 2, CAT Reporters would submit data to the Central Repository in single mandatory specified format, such as an augmented version of the OATS protocol. Under Approach 1, the data must be converted into a uniform format at the Central Repository in a second step. Under Approach 2, the data is already in a uniform format at the time of submission. The Plan defers the decision regarding which approach to take until the selection of a Plan Processor and the development of Technical Specifications. The Commission explained its preliminary belief that Approach 1 would likely result in a lower Error Rate than Approach 2 because of increased efficiency and accuracy due to specialization by the Plan Processor.²¹²⁹ However, because of uncertainties regarding expected Error Rates and error rates in current data, the Commission was unable to evaluate the degree to which the approach would improve data accuracy relative to currently available data.²¹³⁰

The Commission also discussed its belief that the Plan’s requirement for standardized Allocation Reports that consistently and uniquely identify Customers and CAT Reporters should improve the linkability of allocation information compared to current data, despite the limitation of direct linkage to order lifecycles, particularly in scenarios where potentially violative conduct is carried out by market participants operating through multiple broker-dealers.²¹³¹ The Commission stated that this moderate improvement in the linkability of allocation data should

2129 Id.

2130 Id.

2131 Id.

improve regulators' ability to identify market participants who commit violations related to improper subaccount allocations.

The Commission received two comment letters that agreed with the Commission's assessment that Plan provisions related to data linking would increase the overall accuracy of data available to regulators. One of these commenters stated that, "the provisions in the CAT NMS Plan (linkage requirements, daisy chains, Firm Designated ID) will result in a more complete and accurate linking of order events across market participants and SROs."²¹³² The other commenter agreed that data accuracy would improve.²¹³³

Commenters also opined on whether data should be stored in a standardized format and on the relative economic effects of different approaches to data ingestion formats. One commenter stated that the Plan's requirement to store data in a standardized format would increase accuracy within that format, but on the other hand, transformation by CAT Reporters could introduce errors during the data submission process.²¹³⁴ The commenter further stated that using original data reduces the chance of introducing noise.²¹³⁵ Several commenters indicated that existing and widely used formats or protocols for data ingestion would promote better data accuracy.²¹³⁶ Some also noted that without a uniform data ingestion format, data quality would suffer.²¹³⁷

²¹³² FIF Letter at 96.

²¹³³ Data Boiler Letter at 31.

²¹³⁴ Data Boiler Letter at 31.

²¹³⁵ Data Boiler Letter at 18.

²¹³⁶ FIF Letter at 90–91; FIX Letter at 1; ICI Letter at 13; Better Markets Letter at 7–8.

²¹³⁷ Better Markets Letter at 7–8; UnaVista Letter at 2–3.

The Commission received one comment related to the ability to link allocations under the Plan. Specifically, the commenter stated that an allocation report is “undeniably useful for analytic[al] purpose[s],” but noted challenges in linking account and subaccount information to which an execution is allocated.²¹³⁸

The Commission has considered the comment letters received, and continues to believe that the requirements of the Plan related to data linking would result in improvements to the accuracy of the data available to regulators. The Commission agrees with the commenter who stated that transforming data into a uniform format can introduce errors, but the Commission believes such errors will be less common and severe than those introduced currently by multiple regulators independently linking together many different data sources with different formats.²¹³⁹ The Commission agrees with the commenters that stated requiring existing and widely used formats for data ingestion would promote the accuracy of data. Because the Plan does not mandate an ingestion format, uncertainty exists as to what ingestion format (or formats) will be required and whether the ingestion format(s) ultimately selected will promote accuracy as much as alternatives. The Commission acknowledges this uncertainty. In response to the commenters that stated that data quality would suffer without a uniform data ingestion format, as specified in Approach 2, the Commission continues to believe that the benefits to data accuracy are potentially greater using Approach 1, where data is ingested in an existing industry standard protocol of the submitter’s choice and subsequently converted to a uniform format at the Central Repository. The Commission believes this approach is more likely to benefit data accuracy because, as stated by a commenter, allowing the use of original data eliminates the introduction

²¹³⁸ Data Boiler Letter at 24–25.

²¹³⁹ See Section V.D.2.b.(2).C, supra.

of errors and specialization by the Plan Processor should keep to a minimum the number of errors introduced during the conversion process.

With regards to the commenter who noted the challenges in linking allocation and sub-account information with executions using the Plan's approach, the Commission agrees that this approach may result in certain drawbacks, such as having access to less accurate allocation linkages compared to the approach under Rule 613, which required a link between allocations and executions.²¹⁴⁰ However, the Commission continues to believe, as set out in the Notice, that the Plan's Allocation approach will provide regulators with the necessary information to detect abuses in the allocation process without placing undue burdens on broker-dealers.

(5) Customer and Reporter IDs

In the Notice, the Commission discussed its preliminary belief that the inclusion of the unique Customer and CAT Reporter Identifiers described in the CAT NMS Plan would increase the accuracy of customer and broker-dealer information in data regulators use and provide

²¹⁴⁰ In the Notice, the Commission discussed an alternative that would require the Rule 613 approach to allocation reporting linking. The Commission stated that linking allocations to order lifecycles would improve accuracy for many situations, particularly in one-to-one, one-to-many, and many-to-one allocations. Further, the Commission explained that broker-dealers likely already maintain records that allow them to ensure that the allocations receive fair prices based on market executions, and requested comment on whether those systems could provide a key to accurately link allocations to lifecycles in many-to-many allocations. See Notice, supra note 5, at 30757-58. One commenter, however, stated that the "many-to-many relationships [between executions and allocations] do not allow unique linkages for all situations." See FIF Letter at 90. This commenter did not refute the accuracy improvements that could come from linking allocations to order lifecycles. Another commenter opined that broker-dealers should and can track order allocation information, including in the many-to-many situation. See Data Boiler at 40. Therefore, the Commission continues to believe that such linking would be beneficial relative to the Plan. However, the Commission also believes that allocation linking would be costly to implement, a belief supported by the commenter who provided additional information on the source of such costs. See FIF Letter at 90.

benefits to a broad range of regulatory activities that involve audit trail data.²¹⁴¹ The Commission explained that it is currently difficult for regulators to identify the trading of a single customer across multiple market participants because many existing data sources use inconsistent definitions and mappings across market centers.²¹⁴² In addition, the Commission discussed how the Customer Information Approach specified in the CAT NMS Plan requires the Plan Processor to create a unique Customer-ID that would be consistent across that Customer's activity regardless of the originating broker-dealer.²¹⁴³ The Commission discussed its preliminary belief that the Customer-ID approach constitutes a significant improvement relative to the Baseline because it would consistently identify the Customer responsible for market activity, obviating the need for regulators to collect and reconcile Customer Identifying Information from multiple broker-dealers.

Also, in the Notice, the Commission discussed the challenges that regulators face in tracking broker-dealers' activities across markets due to inconsistent identifiers and a lack of a centralized database.²¹⁴⁴ The CAT NMS Plan calls for the use of CAT-Reporter-IDs, which would be assigned to each CAT Reporter by the Plan Processor in the CAT Data.²¹⁴⁵ In the Notice, the Commission stated that it preliminarily believed that the existing identifier approach specified in the CAT NMS Plan would improve the accuracy of tracking information regarding entities with reporting obligations, namely broker-dealers and SROs.

²¹⁴¹ See Notice, supra note 5, at 30686–88.

²¹⁴² Id.

²¹⁴³ Id.

²¹⁴⁴ Id.

²¹⁴⁵ Id.

One commenter stated that there are “flaws to the approaches of CAT Customer and Reporter Identifiers, thus it has little benefit to improve the accuracy of information.”²¹⁴⁶ The commenter, however, did not list these flaws and did not provide specific reasons why the identifiers would not improve data accuracy. Another commenter stated that assigning a unique ID to “every person that ever trades a security” could render the data difficult to use, and that greater difficulties could arise from allowing broker-dealers to assign their own unique customer IDs.²¹⁴⁷ However, the commenter did not specify in detail what difficulties would arise or why the data would be difficult to use. That commenter noted that unique IDs for every client might be unnecessary, and suggested applying them only to those with a certain threshold of trading activity.²¹⁴⁸ Two commenters suggested that the use of the LEI would improve the accuracy of Customer Identifying Information. One commenter suggested that using LEIs would allow market participants to be “easily identified,” and also suggested that the LEI should be used to identify customers in conjunction with other recognized personal identifiers, to promote accurate identification.²¹⁴⁹ Another stated that using the LEI would allow for “unambiguous identification” of entities submitting information to the CAT system and would allow the SEC “to be clear about the identity of entities it is monitoring.”²¹⁵⁰

In their response, the Participants stated that, based on discussions with the DAG, they agreed with the commenters that it would be reasonable to require an Industry Member to

²¹⁴⁶ Data Boiler Letter at 31.

²¹⁴⁷ Anonymous Letter I at 3.

²¹⁴⁸ Anonymous Letter I at 3.

²¹⁴⁹ UnaVista Letter at 3.

²¹⁵⁰ SIFMA Letter at 37.

provide its own LEI and the LEIs of its customers to the CAT if the Industry Member has or acquires such LEIs.²¹⁵¹ As discussed above, the Commission agrees with the commenters and the Participants and has modified the Plan to require the reporting of LEIs for Customers and Industry Members in certain circumstances.²¹⁵²

The Commission has considered the comment letters received, the Participants' response, and modifications to the Plan. The Commission believes that limiting unique customer IDs to clients meeting a certain threshold of trading activity would significantly limit the benefits of the Plan in terms of accuracy.²¹⁵³ As discussed in more detail below, the Commission expects consistent Customer IDs to improve the ability of regulators to identify insider trading, manipulation and other potentially violative activity.²¹⁵⁴ The commenter that stated that assigning a unique ID to "every person that ever trades a security" could render the data difficult to use²¹⁵⁵ did not explain in detail what difficulties might arise. Similarly, the commenter that suggested that the accuracy benefits of the Plan would be limited due to "flaws to the approaches of CAT Customer and Reporter Identifiers"²¹⁵⁶ likewise did not provide any details as to these flaws or how they would affect the accuracy of the CAT Data. In light of the lack of specificity in these comment letters, the Commission continues to believe that the inclusion of unique

²¹⁵¹ Response Letter II at 5.

²¹⁵² See Sections IV.D.4.a.(4) and IV.D.4.b.(2), supra, for a description of the LEI reporting requirements in the Plan.

²¹⁵³ Anonymous Letter I at 3.

²¹⁵⁴ See Section IV.E.2.c., infra.

²¹⁵⁵ Anonymous Letter I at 3.

²¹⁵⁶ Data Boiler Letter at 31.

Customer and Reporter Identifiers as described in the CAT NMS Plan would increase the accuracy of customer and broker-dealer information in data used by regulators.

The Commission is, however, updating its economic analysis to recognize modifications to the Plan to require the reporting of LEI as part of the Customer Identifying Information if the Customer has an LEI and the Industry Member has collected it, and as a part of identifying information for Industry Members in addition to the CRD number, if the Industry Member has an LEI.²¹⁵⁷ Currently, none of the sources of trade and order data discussed above in the Baseline include LEIs for Customers or Industry Members. Based on information provided by commenters who suggested the inclusion of LEI,²¹⁵⁸ supplemented by Commission Staff experience, the Commission believes that the inclusion of an LEI in CAT Data will improve the accuracy of CAT Data by enabling the linking of the data to other data sources such as foreign jurisdictions and domestic data not included in CAT at this time (e.g., futures and security-based swaps), as LEIs become more widely used by regulators and the financial industry. In addition, the Commission expects the modification to improve the accuracy of the data by providing more information about the identities of Industry Members and Customers, including – as the LEI system starts to collect parent and subsidiary information – their relationships with other entities.²¹⁵⁹ The Commission notes, however, that the benefits of the LEI information will be limited insofar as the reporting of an LEI is required for Industry Members only where the

²¹⁵⁷ See Sections IV.D.4.a and IV.D.4.b, supra.

²¹⁵⁸ SIFMA Letter at 36–37; DTCC Letter at 1–6; UnaVista Letter at 3; Better Markets Letter at 8; Data Boiler Letter at 22.

²¹⁵⁹ SIFMA Letter at 37.

Members already have an LEI, and for Customers only where the Customer has an LEI and the Industry Member has or acquires the LEI.²¹⁶⁰

(6) Aggregation

In the Notice, the Commission discussed its belief that most CAT Data would be disaggregated data and that therefore the CAT Data would not suffer from the limitations of the aggregated data sources that regulators must currently use.²¹⁶¹ Currently, subaccount allocation data and issuer repurchase data exist in forms that are aggregated and thus these data sources are limited for use in certain regulatory activities and interests.²¹⁶² In particular, neither data type may necessarily indicate the individual executions. The Commission discussed its preliminary belief that the CAT NMS Plan would improve the accuracy of allocation data compared to existing data available to regulators, because it would provide disaggregated information on the identity of the security, the number of shares and price allocated to each subaccount, when the allocation took place, and how each Customer subaccount is associated with the master account. This would more accurately reflect which Customer ultimately received the shares that were purchased in a particular trade. The Commission anticipated that regulators may use CAT Data for some purposes that they use cleared data for now because the CAT Data would be significantly less aggregated. Finally, the Commission discussed its belief that because the Plan would require that the Plan Processor link Customer information to the order lifecycle and the report would identify as Customers those issuers that are repurchasing their stock in the open

²¹⁶⁰ See Sections IV.D.4.a.(4) and IV.D.4.b.(2), supra.

²¹⁶¹ See Notice, supra note 5, at 30688–89.

²¹⁶² Id. at Section IV.D.2.b.(2)E. Item 703 of Regulation S-K requires issuers to report aggregated issuer repurchase data to the Commission on an annual and quarterly basis in Forms 10-K and 10-Q. 17 CFR 229.703.

market,²¹⁶³ CAT Data would be more accurate and more granular and there would be more data than what is available currently for open market issuer repurchases, which consists of monthly aggregations of those issuer repurchases.

The Commission did not receive any comments regarding its analysis of data aggregation in the Notice, the Participants' response did not specifically address its analysis of data aggregation, and the Commission does not believe that modifications to the Plan warrant changes to this aspect of the economic analysis. The Commission continues to believe that CAT Data would constitute an improvement over current data sources because it would be disaggregated data that would not suffer from the limitations that characterize some of the aggregated data sources that regulators must currently use. Specifically, the Commission continues to believe that the Plan would promote more effective and efficient investigation by regulators of subaccount allocation issues and issuer repurchase activity.

c. Accessibility

In the Notice, the Commission discussed its belief that the Plan, if approved, would substantially improve the accessibility²¹⁶⁴ of regulatory data by providing regulators with direct access to the consolidated CAT Data, including some data elements that currently take weeks or months to obtain. However, the Commission also explained that there is some uncertainty regarding the process for regulatory access under the Plan, which creates uncertainty as to the degree of the expected improvement.²¹⁶⁵

²¹⁶³ See CAT NMS Plan, supra note 5, at Section 6.4(d)(iv).

²¹⁶⁴ Accessibility refers to “how the data is stored, how practical it is to assemble, aggregate, and process the data, and whether all appropriate regulators could acquire the data they need.” See Notice, supra note 5, at 30689.

²¹⁶⁵ Id. at 30689–91.

(1) Direct Access to Data

The Commission recognized in the Notice that improving accessibility of regulatory data relative to the Baseline requires ensuring that enough SRO and Commission Staff members are able to use the direct access system supplied by the Central Repository when they need it. The Commission discussed its belief that the ability to use the direct access system depends, among other things, on how user-friendly the system is, whether it has enough capacity for the expected use of the system, and whether it contains the functionality that the SRO and Commission Staff require. However, the Commission preliminarily believed that “the minimum requirements for the direct access system ensure that the Plan will improve on the Baseline of access to current data, including the process of requesting data.”²¹⁶⁶

In the Notice, the Commission discussed in detail the minimum functional and technical requirements, as set out in Appendix D of the Plan.²¹⁶⁷ In terms of capacity, the Commission noted, among other things, that the Central Repository must be able to support a minimum of 3,000 regulatory users within the system, 600 of which might be accessing the system concurrently (which must be possible without an unacceptable decline in system performance). In terms of functionality, the Commission noted that two types of query interfacing must be supported—an online targeting query tool and a user-defined direct query tool that allows for bulk extraction.²¹⁶⁸ The Commission further noted that all queries must be able to be run against

²¹⁶⁶ Id. at 30689.

²¹⁶⁷ Id. at 30689–90, citing CAT NMS Plan, supra note 5, at Appendix D, Section 8.

²¹⁶⁸ The Commission further explained that the online targeting query tool must include a date or time range, or both, and allow users to choose from a broad menu of 26 pre-defined selection criteria (e.g., data type, listing market, size, price, CAT-Reporter-ID, Customer-ID, or CAT-Order-ID), with more to be defined at a later date. Results must be viewable in the tool or downloadable in a variety of formats and support at least a result

raw (i.e., unlinked) or processed data, or both, and that a variety of minimum performance metrics apply to those queries.

The Commission noted that the direct access facilitated by provisions of the CAT NMS Plan is reasonably designed to substantially reduce the number of ad hoc data requests and provide access to substantial data without the delays and costly time and knowledge investments associated with the need to create and respond to data requests.²¹⁶⁹ The Commission believed that this would dramatically reduce the hundreds of thousands of requests that regulators must make each year in order to obtain data, thus reducing the burden on the industry. For example, the Commission noted that regulators do not have direct access to EBS or trade blotter data and therefore they must request such data when needed for regulatory tasks. As a result, in 2014 the Commission made 3,722 EBS requests that generated 194,696 letters to broker-dealers for EBS data. Likewise, the Commission understood that FINRA requests generate about half this number of letters. In addition, the Commission noted that for examinations of investment advisers and investment companies, it makes approximately 1,200 data requests per year. The Commission also discussed its belief that, in addition to decreasing the amount of time currently required for regulators to access data sources, direct access to the CAT Data should decrease the costs that many regulators and market participants incur in either requesting data or fulfilling requests for data. Furthermore, the Commission discussed its belief that the Plan would also

size of 5,000 or 10,000 records, respectively, with a maximum result size to be determined by the Plan Processor. With the user-defined direct query or bulk extraction, CAT must be able to support at least 3,000 daily queries, including 1,800 concurrently, and up to 300 simultaneous query requests, with no performance degradation. See Notice, supra note 5, at 30689–90.

²¹⁶⁹ Id. at 30690.

permit regulators to directly access customer information, which could improve the ability of SROs to conduct surveillance.²¹⁷⁰

The Commission also discussed its belief that in some dimensions of accessibility, uncertainties exist that could affect the degree of the expected improvement to accessibility. In particular, while the Plan provides detail on the method of access and the types of queries that regulators could run, many of the decisions regarding access have been deferred until after the Plan Processor is selected and finalizes the Technical Specifications.²¹⁷¹ For instance, decisions regarding exactly how regulators would access the data beyond providing them with query tools; how user-friendly these tools will be; whether the Plan Processor would host a server workspace that regulators could use; and whether regulators can perform dynamic searches, data extraction, and offline analysis have not yet been decided. Nonetheless, the Commission stated that the requirements included in the Plan describe a system that, once implemented, would result in the ability to query consolidated data sources, which represents a significant improvement over the currently available systems. This substantial reduction in data delays and costly data investments would permit regulators to complete market reconstructions, analyses, and research projects, as well as investigations and examinations, more effectively and efficiently, and would lead to improved productivity in the array of regulatory matters that rely on data, which should lead to improved investor protection.²¹⁷²

²¹⁷⁰ Id.

²¹⁷¹ Id. at 30691.

²¹⁷² Id.

One commenter argued that “the online targeted query tool and user-defined direct queries and bulk extracts methods will not enable regulatory staff to use the data.”²¹⁷³ This is because these methods do not embed real-time analytics that would allow the system to automatically red-flag suspicious trade activities.²¹⁷⁴ The same commenter agreed that the direct access regulators will have to CAT Data “would help reduce the number of ad-hoc data requests.”²¹⁷⁵ The commenter estimated that such a reduction in the number of data requests would result in cost savings of “about 5%, but definitely not over 10%.”²¹⁷⁶ However, the commenter did not provide any additional information or details to support that estimate.

A second commenter also agreed that the reduction in ad hoc data requests would result in cost savings, stating that the costs associated with responding to EBS requests “will be reduced over time as regulators would no longer need to make EBS inquiries for data that already resides in CAT.”²¹⁷⁷ However, that commenter did not provide any specific estimates of these savings.

Two commenters agreed with the Commission that there is some uncertainty regarding the process for regulatory access to CAT Data.²¹⁷⁸ In particular, one commenter stated that the Plan does not provide details of the technical or procedural mechanisms on how the regulators will access the online targeted query tool or submit user-defined direct queries.²¹⁷⁹ The

²¹⁷³ Data Boiler Letter at 26.

²¹⁷⁴ Data Boiler Letter at 10–13.

²¹⁷⁵ Data Boiler Letter at 31.

²¹⁷⁶ Data Boiler Letter at 38.

²¹⁷⁷ FIF Letter at 34–35.

²¹⁷⁸ SIFMA Letter at 32, 39–41; Data Boiler Letter at 26.

²¹⁷⁹ SIFMA Letter at 39.

commenter noted that the Plan does not provide any specifics on the types of technologies or systems that would be required for regulators to download the data or connect to the API to be made available by the Plan Processor.²¹⁸⁰ Furthermore, the commenter pointed out that although the Plan Processor is required to support a minimum of 300 simultaneous query requests with no performance degradation, the Plan does not define a baseline performance for dynamic search against which the performance degradation could be compared.²¹⁸¹ The commenter noted that the Plan requires the Plan Processor to provide such details at least six months before the Participants begin reporting data to the Central Repository.²¹⁸² The commenter stated that there is a risk that six months will be insufficient for regulators to implement any changes necessary in order to be able to use the tools offered by the Plan Processor, and that this could delay regulators' ability to access the CAT Data.²¹⁸³ The other commenter noted generally that there are insufficient details regarding how regulators would access, use and analyze CAT Data, and how regulators' end-use requirements would be addressed.²¹⁸⁴

In their response, the Participants argued that the Plan does provide sufficient detail regarding regulatory access to CAT Data.²¹⁸⁵ In particular, the Participants noted that Section 8 of Appendix D of the Plan describes various tools that will be used for surveillance and analytics. In addition, the Participants noted that the Plan states that the Plan Processor will

²¹⁸⁰ SIFMA Letter at 41.

²¹⁸¹ SIFMA Letter at 40.

²¹⁸² SIFMA Letter at 39.

²¹⁸³ Id.

²¹⁸⁴ Data Boiler Letter at 26.

²¹⁸⁵ Response Letter I at 42.

provide an open API that allows regulators to use analytic tools and will permit regulators to use ODBC/JDBC drivers to access the CAT Data.²¹⁸⁶

The Commission has considered the comments it received regarding the potential benefits of the CAT NMS Plan in terms of the accessibility of regulatory data, as well as the Participants' response. Commenters did not provide any additional information or analysis that changes the Commission's conclusions as set out in the Notice, and there have been no modifications to the Plan that would warrant changes.

With respect to the comment that an online targeted query tool and a user-defined direct query tool will not enable regulatory Staff to use CAT Data,²¹⁸⁷ the Commission disagrees with the commenter's assertion that regulators cannot benefit from direct access to CAT Data unless CAT embeds real-time analytics. In the Notice, the Commission discussed two ways in which regulators could benefit from having direct access to CAT Data facilitated by the availability of an online targeted query tool and a user-defined direct query tool.²¹⁸⁸ First, direct access to CAT Data could substantially reduce the number of ad hoc data requests and decrease the costs that many regulators currently incur in requesting data. Second, the Plan would permit regulators to directly access customer information, which could improve the ability of SROs to conduct

²¹⁸⁶ Response Letter I at 42, citing CAT NMS Plan, *supra* note 5, at Appendix D, Section 8.2. A discussion of the types of data tools that Bidders proposed to support can be found in Appendix C, Section A.2(b) of the Plan. ODBC (Open Database Connectivity) is an open standard API (Application Programming Interface) for accessing a database. JDBC (Java Database Connectivity) is an API for the programming language Java, which defines how a client may access a database.

²¹⁸⁷ Data Boiler Letter at 10–13, 26.

²¹⁸⁸ *See* Notice, *supra* note 5, at 30690.

surveillance, among other benefits discussed below.²¹⁸⁹ Because these benefits of direct access do not depend on the ability of CAT to embed real-time analytics, the Commission continues to believe that the methods of direct access specified in the Plan will improve the accessibility of regulatory data relative to the Baseline.

With respect to the comment that the reduction in the number of data requests would result in cost savings to SROs of “about 5%,” but “definitely not more than 10%,”²¹⁹⁰ the Commission notes that the commenter did not explain the basis for its estimate. The Commission acknowledged in the Notice that it lacks the necessary information to estimate the magnitude of these cost savings, and this continues to be the case, as the Commission has not received any additional information it can use to estimate the savings. However, the Commission continues to believe that direct access to CAT Data should decrease the costs that many regulators and market participants incur in either requesting data or fulfilling requests for data.

With respect to the comments about uncertainties regarding the process for regulatory access to CAT Data,²¹⁹¹ the Commission agrees with the commenter that, as discussed in the Notice, there is some uncertainty regarding the process for regulatory access under the Plan. The Commission notes that while the Plan provides detail on the method of access and the type of queries that regulators could run, many of the decisions regarding access have been deferred until after the Plan Processor is selected and finalizes the Technical Specifications. In particular,

²¹⁸⁹ See Section V.E.2, *infra*, for a discussion of various regulatory activities that direct access to data will improve.

²¹⁹⁰ Data Boiler Letter at 38.

²¹⁹¹ SIFMA Letter at 32, 39–41.

as discussed in the Notice, the details of functionality and performance of the final CAT System are still to be determined.²¹⁹² The Commission continues to believe that these functionality and performance uncertainties create some uncertainty regarding the degree of improvement in regulatory access that will result from the Plan. The Commission agrees that is possible that, as one commenter noted,²¹⁹³ the deferral of these decisions could result in a delay in regulators' ability to access the CAT Data. However, the Commission continues to believe that the Plan will substantially improve the accessibility²¹⁹⁴ of regulatory data relative to the Baseline by providing regulators with direct access to the CAT Data.

(2) Consolidation of Data

In the Notice, the Commission stated that it preliminarily believed that the Plan would improve accessibility by consolidating various data elements into one combined source, reducing data fragmentation.²¹⁹⁵ Currently, audit trail data for securities that are traded on multiple venues (multiple exchanges or off-exchange venues) is fragmented across multiple data sources, with each regulator generally having direct access only to data generated on the trading venues it regulates.²¹⁹⁶ The Commission explained that the Plan would bring audit trail data related to trading on all venues into the Central Repository where it could be accessed by all regulators.

²¹⁹² See Notice, supra note 5, at 30691.

²¹⁹³ SIFMA Letter at 39.

²¹⁹⁴ Accessibility refers to “how the data is stored, how practical it is to assemble, aggregate, and process the data, and whether all appropriate regulators could acquire the data they need.” See Notice, supra note 5, at 30689.

²¹⁹⁵ Id. at 30690.

²¹⁹⁶ The Commission recognizes that FINRA collects data from exchanges for which it provides regulatory services. However, this data is sent to FINRA by the exchanges with a delay, and the data formats are not standardized prior to receipt at FINRA.

Additionally, the Commission noted that Rule 613 requires that the Plan include both equity and options data.²¹⁹⁷ Because no existing regulatory audit trail data source includes both options and equities data, the Notice discussed the fact that collecting this data and providing access would allow regulators to monitor and run surveillance on the activity of market participants in related instruments, such as when a market participant has activity in both options and the options' underlying assets. The Commission noted that the Plan would also marginally increase the accessibility of historical exchange data. In particular, Section 6.5(b)(i) of the Plan requires that the Central Repository make historical data available for not less than six years, in a manner that is directly accessible and searchable electronically without manual intervention by the Plan Processor.²¹⁹⁸

The Commission did not receive any comments on this aspect of accessibility, and there have not been any modifications to the Plan related to this aspect of the Commission's analysis. The Commission therefore continues to believe that the Plan will improve accessibility relative to the Baseline by consolidating various data elements into one combined source, reducing data fragmentation.

d. Timeliness

In the Notice, the Commission discussed its belief that, if approved, the CAT NMS Plan

²¹⁹⁷ 17 CFR 242.613(c)(5), (c)(6).

²¹⁹⁸ See CAT NMS Plan, supra note 5, at Section 6.5(b)(i). Currently, broker-dealers retain data for six years, but exchanges are only required to retain data for five years. In practice, the Commission understands that most exchanges generally retain data for at least six years, but at least one exchange does not retain data for six or more years. Therefore, the CAT NMS Plan would improve the historical data available from at least one exchange.

would significantly improve the timeliness²¹⁹⁹ of reporting, compiling, and accessing regulatory data, which would benefit a wide array of regulatory activities that use or could use audit trail data. The Commission discussed its belief that the timeline for compiling and reporting data pursuant to the Plan would constitute an improvement over the processes currently in place for many existing data sources and that, relative to some data sources, the improvement would be dramatic. Specifically, under the Plan, CAT Data would be compiled and made ready for access faster than is the case today for some data, both in raw and in corrected form; regulators would be able to query and manipulate the CAT Data without going through a lengthy data request process; and the data would be in a format to make it more immediately useful for regulatory purposes.²²⁰⁰

In terms of initial access to the data, the Commission discussed its belief that the Plan would require CAT Reporters to report data to the Central Repository at times that are on par with current audit trails that require reporting, but the Central Repository would compile²²⁰¹ the data for initial access sooner than some other such data.²²⁰² For example, equity and option clearing data currently are not compiled and reported to the NSCC and the OCC until T+3, and data in EBS reports are not compiled and reported to a centralized database until a request is

²¹⁹⁹ Timeliness refers to when the data is available to regulators and how long it would take to process before it could be used for regulatory analysis. See Notice, supra note 5, at 30691.

²²⁰⁰ Id.

²²⁰¹ Compiling data refers “to a process that aggregates individual data records into a data set. This could occur when regulators request data and when the regulators receive data from multiple providers. This is different from the act of reporting data.” Id.

²²⁰² Id. at 30691–92.

received.²²⁰³ OATS data is initially reported to FINRA by 8:00 a.m. ET on the calendar day following the reportable event, and it takes approximately 24 hours for FINRA to run validation checks on the file, though SROs do not currently access OATS information for regulatory purposes until after the error correction process is complete.²²⁰⁴

Furthermore, the Commission discussed the fact that, to the extent that access to the raw (i.e., uncorrected and unlinked) data would be useful for regulatory purposes, the CAT NMS Plan provides a way for SROs and the Commission to access the uncorrected and unlinked data on T+1 by 12:00 p.m. ET at the latest.²²⁰⁵ Under the Plan, this access would be at least several days sooner than OATS is available to non-FINRA regulators. In the Notice, the Commission acknowledged that the Plan would not necessarily improve the timeliness of audit trail data in every case or for every regulator. For example, exchange SROs already have real-time access to their own audit trail data.²²⁰⁶ However, regulators at other SROs or the Commission do not have real-time access to that audit trail data, and therefore the Commission stated that it preliminarily believed that CAT Data could be more timely for these other regulators to access and use than

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Id.

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Id.

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Id. at 30691.

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Under the Plan, SROs that are exchanges would still have the same real-time access to their own audit trail data as they currently do. The Commission does not expect that all SRO audit trails will be retired on implementation of the Plan because exchanges may use such audit trails to implement their CAT reporting responsibilities. CAT reporting requirements would require that exchanges collect and report audit trail information from their systems even if they elect to replace their current audit trails. However, CAT requirements may improve the completeness of real-time exchange audit trail data if the information that exchanges collect under the Plan is more complete than what they currently collect.

obtaining that exchange's audit trail data through other means.²²⁰⁷

In terms of timeliness of access to error-corrected data, the Commission stated in the Notice that it preliminarily believed that the error correction process required by the CAT NMS Plan is reasonably designed to provide additional improvements in timeliness for corrected data. The Plan specifies that the initial data validation and communication of errors to CAT Reporters must occur by noon on T+1 and that corrections of these errors must be submitted by the CAT Reporters to the Central Repository by 8:00 a.m. ET on T+3, with the corrected data made available to the regulators by 8:00 a.m. ET on T+5.²²⁰⁸ During this interim time period between initial processing and corrected data availability, "all iterations" of processed data must be available for regulatory use.²²⁰⁹ The Central Repository must be able to receive error corrections at any time, even if late,²²¹⁰ if corrections are received after T+5, the Plan Processor must notify the SEC and SROs of this fact and describe how re-processing of the data (to be determined in conjunction with the Operating Committee) would be completed.²²¹¹ Customer information (i.e., information containing PII) is processed along a slightly different timeline, but the outcome—

²²⁰⁷ As noted, the SROs are generally currently able to access their own audit trail data on the same day of an event and the Commission is currently able to access some public data, like SIP and MIDAS, on the same day as an event. Further, OATS is available to FINRA at 8am on the day following an event. The Commission preliminarily does not expect the CAT NMS Plan would affect these regulators' access to most of these respective data sources.

²²⁰⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section A.2(a), Appendix D, Section 6.1.

²²⁰⁹ Id. at Appendix D, Section 6.2.

²²¹⁰ Id. at Appendix C, Section A.3.(b), Appendix D, Section 7.4.

²²¹¹ Id. at Appendix D, Section 6.2.

corrected data available by 8:00 a.m. ET on T+5—is the same.²²¹² One exception to this timeline is if the Plan Processor has not received a significant portion of the data, as determined according to the Plan Processor’s monitoring, in which case the Plan Processor could determine to halt processing pending submission of that data.²²¹³ The Commission noted that the error resolution process for OATS is limited to five business days from the date a rejection becomes available.²²¹⁴ The CAT NMS Plan requires a three-day repair window for the Central Repository.²²¹⁵ Accordingly, the Commission stated that if the Plan were approved, regulators would generally be able to access partially and fully corrected data earlier than they would for OATS.²²¹⁶

In the Notice, the Commission discussed its belief that improvements to timeliness would also result from the ability of regulators to directly access CAT Data.²²¹⁷ The Commission discussed the fact that most current data sources do not provide direct access to most regulators and explained that data requests can take as long as weeks or even months to process. Other data sources provide direct access with queries that can sometimes generate results in minutes—for example, running a search on all MIDAS message traffic in one day can take up to 30 minutes²²¹⁸—but only for a limited subset of the data to be available in CAT and generally only for a limited number of regulators. Accordingly, the Commission stated that it preliminarily

²²¹² Id.

²²¹³ Id. at Appendix D, Section 6.1.

²²¹⁴ See Notice, supra note 5, at Section IV.D.2.b.(4) and n.465.

²²¹⁵ Id. at Appendix C, Section A.2(a).

²²¹⁶ CAT Data being available on T+5 may be later than for other current SRO audit trails.

²²¹⁷ See Notice, supra note 5, at 30692 (citing CAT NMS Plan, supra note 5, Section 6.5(c)).

²²¹⁸ See Notice, supra note 5, at Section IV.D.2.b.(4) and n.468.

believed that the ability of regulators to directly access and analyze the scope of audit trail data that would be stored in the Central Repository should reduce the delays that are currently associated with requesting and receiving data. Furthermore, the Commission discussed its belief that direct access to CAT Data should reduce the costs of making ad hoc data requests, including costs arising from extensive interactions with data liaisons and IT staff at broker-dealers, SROs, and vendors, developing specialized knowledge of varied formats, data structures, and systems, and reconciling data.

The Commission also stated that it preliminarily expected that the CAT NMS Plan would reduce the time required to process data before analysis.²²¹⁹ The Commission explained that currently, regulators can spend days and up to months processing data they receive into a useful format.²²²⁰ Part of this delay is due to the need to combine data across sources that could have non-uniform formats and to link data about the same event both within and across data sources. These kinds of linking processes can require sophisticated data techniques and substantial assumptions and can result in imperfectly linked data. The Commission noted that the Plan addresses this issue by stating that the Plan Processor must store the data in a linked uniform format.²²²¹ Specifically, the Commission discussed how the Central Repository will use a “daisy chain” approach to link and reconstruct the complete lifecycle of each Reportable Event, including all related order events from all CAT Reporters involved in that lifecycle. Therefore, regulators accessing the data in a linked uniform format would no longer need to take additional

²²¹⁹ See Notice, supra note 5, at 30693.

²²²⁰ See Table 1, Section V.D.2.b, supra.

²²²¹ See CAT NMS Plan, supra note 5, at Section 6.5(b)(i). The CAT NMS Plan does not link allocations to order events. See also 17 CFR 242.613(e)(1).

time to process the data into a uniform format or to link the data.²²²² Accordingly, the Commission stated that it preliminarily believed that the Plan would reduce or eliminate the delays associated with merging and linking order events within the same lifecycle and that the Plan would improve the timeliness of FINRA's access to the data it uses for much of its surveillance by several days because the corrected and linked CAT Data would be accessible on T+5 compared to FINRA's T+8 access to its corrected and linked data combining OATS with exchange audit trails.²²²³

The Commission also discussed its belief that the expected improvements to data accuracy could result in an increase in the timeliness of data that is ready for analysis, although uncertainty exists regarding the extent of this benefit. The Commission explained that regulators currently take significant time to ensure data is accurate beyond the time that it takes data sources to validate data and that, in some cases, data users may engage in a lengthy iterative process involving a back and forth with the staff of a data provider in order to obtain accurate data necessary for a regulatory inquiry. Accordingly, the Commission stated that, to the extent that the Central Repository's validation process is sufficiently reliable and complete, the duration of the error resolution process regulators would perform with CAT Data may be shorter than for current data. Further, to the extent that the Central Repository's linking and reformatting processes are sufficiently successful, the SROs and Commission may not need a lengthy process to ensure the receipt of accurate data. However, the Commission noted that it lacked sufficient

²²²² The daisy chain approach is used to link and reconstruct the complete lifecycle of each Reportable Event in CAT. According to this approach, CAT Reporters assign their own identifiers to each order event that the Plan Processor later replaces with a single identifier (the CAT Order-ID) for all order events pertaining to the same order. See Notice, supra note 5, at 30691.

²²²³ Id. at 30693.

information on the validations, linking, and reformatting processes needed to draw a strong conclusion as to whether users would take less time to validate CAT Data than they take on current data. Nonetheless, the Commission preliminarily believed that the linking and reformatting processes at the Central Repository would be more accurate than the current decentralized processes such that it would reduce the time that regulators spend linking and reformatting data prior to use.

The Commission received comments on the improvements in timeliness from the Plan. Two commenters suggested that CAT Data would not be timely enough because it is reported too late.²²²⁴ One commenter called the reporting deadline (8:00 a.m. ET on T+1) an “extraordinarily lax reporting time frame.”²²²⁵ Another commenter argued that the T+5 schedule for regulatory access to corrected CAT Data is “useless in terms of effective market surveillance in prevention of threats to the U.S. financial stability” because a “huge loss can be accumulated within [a] split-second” and “market collapse does not take more than one day.”²²²⁶ Furthermore, although the commenter agreed that “CAT offers the regulators on-demand query of delayed data that saves them multiple trips to request data from the financial institutions,” he opined that this “does not necessarily mean timeliness improvement.”²²²⁷

The Participants’ response provided additional information on error correction timelines for customer information and PII. Specifically, the Participants’ response identified an errant discussion of these error correction timelines in the Plan, and clarified that the Plan Processor

²²²⁴ Data Boiler Letter at 18; Better Markets Letter at 6.

²²²⁵ Better Markets Letter at 6.

²²²⁶ Data Boiler Letter at 26.

²²²⁷ Data Boiler Letter at 32.

must validate customer data and generate error reports no later than 5:00 p.m. ET on T+1, and stated that they believe the two day period for error correction is sufficient for CAT Reporters to correct errors in customer data.²²²⁸

The Commission has considered the comments it received regarding the potential of the Plan to improve timeliness. As discussed below, the commenters did not provide any additional information or analysis that the Commission believes would warrant changes to its analysis or conclusions as set out in the Notice.

The Commission disagrees with the commenter that characterized the next day reporting of CAT Data as an “extraordinarily lax reporting time frame,” and with the commenter that argued that the T+5 schedule for regulatory access to corrected CAT Data is insufficient.²²²⁹ As discussed further above,²²³⁰ the Commission considered whether CAT Reporters should be required to report data in real-time when it adopted Rule 613 under Regulation NMS.²²³¹ While the Commission acknowledged that there might be advantages to receiving data intraday, the Commission stated that the greater majority of benefits that may be realized from development of the CAT do not require real-time reporting.²²³² Furthermore, many SROs have real-time access to data generated on exchanges they operate, and can and do use this data for real-time surveillance of activity occurring on those exchanges. As discussed in the Notice, the T+5

²²²⁸ Response Letter I at 30.

²²²⁹ Data Boiler Letter at 26.

²²³⁰ See Section IV.D.3, supra.

²²³¹ See Adopting Release, supra note 13, at 45765. Indeed, Rule 613 stated that the CAT NMS Plan may not impose a reporting deadline earlier than 8:00 a.m. ET. 17 CFR 242.613(c)(3).

²²³² Id.

schedule improves the timeliness of regulatory access to corrected data relative to the Baseline in two ways.²²³³ First, corrected OATS data is currently available to FINRA at T+8.²²³⁴ Under the Plan, regulators will be able to access corrected CAT Data three days earlier than that (i.e., T+5). Second, the ability of regulators to directly access CAT Data will improve timeliness.²²³⁵ Most current data sources do not provide direct access to most regulators, and data requests can take as long as weeks or even months to process. Therefore, for many purposes, the T+5 schedule for regulatory access to corrected CAT Data will be up to many weeks more timely relative to the Baseline.

The Commission also disagrees with the comment that the ability of regulators to directly access CAT Data will not result in improvement in timeliness.²²³⁶ The comment does not dispute that data requests can take time to process and it does not provide any specificity in arguing that direct access would not improve timeliness that undermines the Commission's belief that direct access will make CAT Data up to many weeks more timely. This represents an important improvement in timeliness over the Baseline.

Regarding the Participants' response, the Commission does not believe the clarification regarding the timeline for communication of errors for customer and account information would warrant changes to its analysis or conclusions regarding timeliness. The Commission notes that the Plan states that 5:00 p.m. ET on T+1 is the deadline for communication of errors for

²²³³ See Notice, supra note 5, at Section IV.E.1.d(2) and Section IV.E.1.d(3).

²²³⁴ Id. at 30673.

²²³⁵ Id. at 30692.

²²³⁶ Data Boiler Letter at 32.

customer and account information, including PII.²²³⁷ In separate exposition, the Plan mistakenly discussed 12:00 p.m. ET on T+3 as the deadline for validation of data and generation of error reports for CAT PII data.²²³⁸ These two statements are in conflict because they describe different reporting deadlines for the same types of errors. However, the Commission is amending the Plan to correct that error.²²³⁹ In the Notice, the Commission states that customer information has a separate error correction timeline with the same outcome in terms of the availability of corrected data to regulators; this analysis was not dependent on the time at which error messages were sent to CAT Reporters.²²⁴⁰ Consequently, the clarification of this timeline does not affect the Commission’s analysis. Furthermore, the Commission notes that commenters did not raise questions on the mistake and seem to have understood that the deadline for error reports on PII was 5:00 p.m. ET on T+1.

2. Improvements to Regulatory Activities

In the Notice, the Commission discussed its preliminary belief that improvements in the quality of available data have the potential to result in improvements in the analysis and reconstruction of market events; market analysis and research in support of regulatory decisions; and market surveillance, examinations, investigations, and other enforcement functions.²²⁴¹ The Commission discussed its belief that the ability of regulators to perform analyses and reconstruction of market events would likely improve if the CAT NMS Plan were approved,

²²³⁷ See CAT NMS Plan, supra note 5, at Appendix D, Section 6.2.

²²³⁸ Id.

²²³⁹ See note 1555, supra.

²²⁴⁰ See Notice, supra note 5, at 30692.

²²⁴¹ Id. at 30693–99.

because it would allow regulators to provide investors and other market participants with more timely and accurate explanations of market events, and to develop more effective responses to such events. Furthermore, availability of CAT Data would benefit market analysis and research in support of regulatory decisions, by facilitating an improved understanding of markets that will inform potential policy decisions. The Commission also discussed how regulatory initiatives that are based on an accurate understanding of underlying events and are narrowly tailored to address any market deficiency should improve market quality and benefit investors.

The Commission also explained that, in its preliminary view, the Plan would substantially improve both the efficiency and effectiveness of SRO broad market surveillance, which could benefit investors and market participants by allowing SROs to more quickly and precisely identify and address a higher proportion of market violations that occur, as well as prevent violative behavior through deterrence.

The Commission discussed in the Notice its expectation that CAT Data would enhance the SROs' and the Commission's abilities to effectively target risk-based examinations of market participants who are at elevated risk of violating market rules, as well as their abilities to conduct those examinations efficiently and effectively, which could also contribute to the identification and resolution of a higher proportion of violative behavior in the markets. Accordingly, the reduction of violative behavior in the market should benefit investors by providing them with a safer environment for allocating their capital and making financial decisions, and it could also benefit market participants whose business activities are harmed by the violative behavior of other market participants. The Commission further discussed how more targeted examinations could benefit market participants by resulting in proportionately fewer burdensome examinations of compliant market participants.

The Commission also explained that a significant percentage of Commission enforcement actions involve trade and order data,²²⁴² and that it preliminarily believed CAT Data would significantly improve the efficiency and efficacy of enforcement investigations by the Commission and SROs, including insider trading and manipulation investigations.

The Commission also stated that it as well as the SROs anticipated additional benefits associated with enhanced abilities to handle tips, complaints and referrals, and improvements in the speed with which they could be addressed, particularly in connection with the significant number of tips, complaints, and referrals that relate to manipulation, insider trading, or other trading and pricing issues.²²⁴³ The Commission explained that the benefits to investor protection of an improved tips, complaints, and referrals system would largely mirror the benefits to investor protection that would accrue through improved surveillance and examinations efficiency.

²²⁴² In 2015, the Commission filed 807 enforcement actions, including 39 related to insider trading, 43 related to market manipulation, 124 related to broker-dealers, 126 related to investment advisers/investment companies, and one related to exchange or SRO duties, many of which involved trade and order data. In 2014, the Commission filed 755 enforcement actions, including 52 related to insider trading, 63 related to market manipulation, 166 related to broker-dealers, and 130 related to investment advisers/investment companies, many of which also involved trade and order data. See Year-by-Year SEC Enforcement Statistics, available at <https://www.sec.gov/news/newsroom/images/enfstats.pdf>. The total number of actions filed is not necessarily the same as the number of investigations. An investigation may result in no filings, one filing, or multiple filings. Additionally, trade and order data may be utilized in enforcement investigations that do not lead to any filings. Based on these numbers, the Commission estimates that 30–50% of its enforcement actions incorporate trading or order data. A portion of FINRA’s 1,397 disciplinary actions in 2014 and 1,512 in 2015 also involved trading or order data. See <http://www.finra.org/newsroom/statistics>.

²²⁴³ In fiscal years 2014 and 2015, the Commission received around 15,000 entries in its TCR system, approximately one third of which related to manipulation, insider trading, market events, or other trading and pricing issues.

As discussed more fully below, the Commission has considered the comments it received regarding the likely benefits to regulatory activities, the Participants' response, and modifications to the Plan, and continues to believe that the CAT NMS Plan would generate improvements to regulatory activities, particularly in the analysis and reconstruction of market events; market analysis and research in support of regulatory decisions; and market surveillance, examinations, investigations, and other enforcement activities.

a. Analysis and Reconstruction of Market Events

In the Notice, the Commission discussed the reasons for its preliminary belief that the Plan would improve regulators' ability to perform analysis and reconstruction of market events.²²⁴⁴ As noted in the Adopting Release, the sooner regulators can complete a market reconstruction, the sooner regulators can begin reviewing an event to determine what happened, who was affected and how, if any regulatory responses might be required to address the event, and what shape such responses should take.²²⁴⁵ Furthermore, the improved ability for regulators to generate prompt and complete market reconstructions could provide improved market knowledge, which could assist regulators in conducting retrospective analysis of their rules and pilots.

The Commission discussed how the fragmented nature of current audit trail data and the lack of direct access to such data renders market reconstructions cumbersome and time-consuming.²²⁴⁶ Currently, the information needed to perform these analyses is spread across

²²⁴⁴ See Notice, supra note 5, at 30694–95.

²²⁴⁵ See Adopting Release, supra note 14, at 45732.

²²⁴⁶ During the financial crisis in 2008, the lack of direct access to audit trail data resulted in the Commission being unable to quickly and efficiently reconstruct market events. The state of OATS data in 2008 also limited FINRA's ability to analyze and reconstruct the

multiple audit trails, with some residing in broker-dealer order systems and trade blotters. Requesting the data necessary for a reconstruction of a market event often takes weeks or months and, once received, regulators then need weeks to reconcile disparate data formats used in different data sources. Some of the most detailed data sources, including sources like EBS and trade blotters that identify customers, are impractical for broad-based reconstructions of market events. In particular, including EBS data for a reconstruction of trading in the market for even one security on one day could involve many, perhaps hundreds, of requests, and would require linking that to SRO audit trail data or public data.²²⁴⁷ Further, because EBS data lacks timestamps for certain trades,²²⁴⁸ the Commission discussed how the use of EBS data in market reconstructions requires supplementation with data from other sources, such as trade blotters.

The Commission stated that it expected that improvements in data completeness and accuracy from the Plan would enhance regulators' ability to perform analyses and to reach conclusions faster in the wake of a market event by reducing the time needed to collect,

market during the financial crisis because FINRA could not yet augment its OATS data with exchange data and OATS did not include market maker quotations. As a result, regulators had little information about the role of short sellers in market events and the identity of short sellers during the financial crisis, for example. See Notice, supra note 5, at 30694–95.

²²⁴⁷ Id. at Section IV.E.2.a (noting that in 2014, the SEC made 3,722 EBS requests which generated 194,696 letters to broker-dealers requesting EBS data). The Commission understands that FINRA makes about half this number of requests.

²²⁴⁸ Large traders who file Form 13H with the Commission are assigned a “large trader identification number” by the Commission and must provide that number to their brokers for inclusion in the EBS records that are maintained by the clearing brokers. Rule 13h-1, subject to relief granted by the Commission, requires that execution time be captured (to the second) for certain categories of large traders. Id. at Section IV.D.2.a(3) and Section IV.D.2.b (discussing the EBS system and large trader reports and the limitations of these data sources in performing market reconstructions).

consolidate and link the data.²²⁴⁹ Specifically, the inclusion of Customer-IDs and consistent CAT-Reporter-IDs in the CAT Data would allow regulators to more effectively and efficiently identify market participants that submit orders through several broker-dealers and execute on multiple exchanges and whose activity may warrant further analysis. The Commission discussed its belief that this would be useful if regulators were interested in determining if a particular trader or category of traders had some role in causing the market event, or how they might have adjusted their behavior in response to the event, which could amplify the effects of the root cause or causes. Furthermore, the Commission discussed how the clock synchronization requirements of the Plan would improve the ability of regulators to sequence some events that happened in different market centers to better identify the causes of market events. Overall, the Commission stated that it preliminarily believed that the CAT NMS Plan would dramatically improve the ability of regulators to identify the market participants involved in market events.

The Commission also preliminarily believed that better data accessibility from the Plan would significantly improve the ability of regulators to analyze and reconstruct market events. Because CAT Data would link Reportable Events, the Plan could allow regulators to respond to market events more rapidly because they would not need to process corrected and linked data before starting their analyses.

²²⁴⁹ The Commission stated that the lack of readily available trade and order data resulted in delays and gaps in the Commission’s analysis of the events of the Flash Crash. It was also unable to quickly and efficiently conduct analysis and reconstruction of markets events, particularly around the financial crisis. Furthermore, the Commission and SROs have faced similar challenges when reconstructing events around the May 2012 Facebook IPO, the August 2012 Knight Securities “glitch,” and the August 2013 NASDAQ SIP outage. *Id.* at 30694–95.

The Commission received one comment on the fragmented nature of current audit trail data and the potential benefits of CAT Data to improve the ability of regulators to perform analysis and reconstructions of market events. That commenter agreed with the Commission that the fragmented nature of current data sources poses challenges to regulators seeking complete data,²²⁵⁰ however, the commenter also stated that the potential benefits that CAT Data would provide regulators in terms of conducting analysis and market reconstructions are minimal.²²⁵¹ The Participants did not provide responses to these concerns.

In the Commission's view, this comment did not provide any additional information or analysis that warrants changes to the analysis or conclusions in the Notice. The commenter stated that "the plan is majoring in the minors (i.e., overemphasis on storage, and not enough coverage of pattern recognition)."²²⁵² The Commission disagrees. While the Commission has emphasized aspects of storage as in the Notice,²²⁵³ the Commission has also emphasized that improvements in data completeness and accuracy would greatly assist regulators in performing analyses and reconstructing market events. The inclusion of Customer-IDs and CAT-Reporter-IDs would assist regulators in determining if particular traders had some role in causing a market event, and further, inclusion of these IDs could help regulators study patterns in customer-specific trading behavior. Further, enhanced clock synchronization requirements would assist regulators in sequencing events that happened in different market centers and help them to better identify the causes of market events. As such, the Commission continues to believe that the

²²⁵⁰ Data Boiler Letter at 30.

²²⁵¹ Data Boiler Letter at 33.

²²⁵² Id.

²²⁵³ See Notice, supra note 5, at Sections III.B.3, III.B.12.

CAT NMS Plan would provide benefits in terms of performing analysis and reconstructing market events.

Changes to the Plan do affect data completeness and accuracy, as well as regulators' ability to analyze and reconstruct market events. First, the Commission has modified the Plan to require the reporting of LEIs for Customers and Industry Members in certain circumstances.²²⁵⁴ These requirements will result in a greater ability of regulators to accurately identify traders that cause market events.²²⁵⁵ Second, removing the open/close indicator for equities and Options Market Makers may reduce the completeness of CAT Data and may reduce the benefits that this potentially provides in terms of analysis and market reconstructions. Third, requiring exchanges to synchronize their clocks within 100 microseconds of NIST should enhance regulators' abilities to sequence events and reconstruct market events to a greater degree than initially stated in the Notice, though as discussed above in Section V.E.1.b.(3), the Commission does not expect a large improvement relative to what was described in the Notice.

b. Market Analysis and Research

In the Notice, the Commission discussed the reasons for its preliminary belief that the CAT NMS Plan would benefit the quality of market analysis and research that is produced to increase regulatory knowledge and support policy decisions and would lead to a more thorough understanding of current markets and emerging issues.²²⁵⁶ The Commission discussed how

²²⁵⁴ See Section IV.D.4.a.(4) and Section IV.D.4.b.(2), supra, for a description of the LEI reporting requirements in the Plan.

²²⁵⁵ See Section V.E.1.b(5), supra for a discussion of how LEIs can increase the accuracy of identifications; see also SIFMA Letter at 37.

²²⁵⁶ For example, this includes understanding the role and impact of high-frequency trading strategies; understanding how broker-dealers route their customer orders and studying “whether access fees and rebates drive routing decisions as much as execution quality

improvements in regulatory market analysis and research aimed at informing regulatory decisions would benefit investors and market participants by improving regulators' understanding of the intricacies of dynamic modern markets and how different market participants behave in response to policies and information. These more nuanced and more thorough insights would help regulators to identify the need for regulation that specifically tailors policy to the diverse landscape of market participants and conditions that characterize current financial markets, as well as assist them in conducting retrospective analysis of their rules and pilots.

As described in the Notice, the lack of direct access to necessary data, along with inaccuracies in the data that are available, currently limits the types of analyses that regulators can conduct. These data limitations constrain the information available to regulators when they are considering the potential effects of regulatory decisions. The CAT NMS Plan would provide direct access to data that currently requires an often lengthy and labor-intensive effort to request, compile, and process, including data that regulators could use to more directly study issues such as high frequency trading, maker-taker pricing structures, short selling, issuer repurchases, and ETF trading. Furthermore, the Commission discussed how CAT Data would better inform SROs and the Commission in rulemakings and assist them in conducting retrospective analysis of their rules and pilots, and how it would allow SROs to examine whether a rule change on another exchange was in the interest of investors and whether to propose a similar rule on their own exchange.

considerations;" understanding the nature of short selling; and more generally, understanding how entities trade and the market impact of their trading. See Notice, supra note 5, at 30695–97.

The Commission received two comments regarding the potential benefits of the CAT NMS Plan to help the Commission perform market analyses and conduct research. One commenter misinterpreted what accessibility to CAT Data means for the Commission, stating that access to the CAT system and data is limited to its regulatory functions and could exclude analytical or academic needs.²²⁵⁷ Another commenter disagreed with the Commission’s findings and stated that the CAT Plan would provide little benefit to facilitating market analysis and research absent real-time access to intra-day feeds.²²⁵⁸

Commenters did not provide any additional information or analysis, however, and the Participants did not provide responses providing information relevant to this issue. The Commission is not changing its analysis and conclusions in light of the aforementioned comments for several reasons. First, one of the commenters assumes a narrow definition of “regulatory functions” but that CAT Data would serve the Commission and SROs in their analytical needs to conduct market analysis and academic research.²²⁵⁹ Second, the Commission believes that even without real-time access to intra-day feeds, access to CAT Data would nonetheless benefit regulators since the quality of market analysis and research that is produced to increase regulatory knowledge would improve relative to the Baseline. Furthermore, the Commission continues to believe its statement in the Adopting Release that the majority regulatory benefits gained from the creation of a consolidated audit trail, as described in the

²²⁵⁷ Better Markets Letter at 4.

²²⁵⁸ Data Boiler Letter at 33.

²²⁵⁹ See Notice, *supra* note 5, at 30695–97 for a list of examples of market analysis and research that could be conducted by SROs and the Commission with access to CAT Data.

Proposing Release,²²⁶⁰ do not require real-time reporting.²²⁶¹ Specifically, the Commission notes that market analysis and research does not require contemporaneous access to CAT Data, and therefore, it is not necessarily the case that real-time access to CAT Data, as opposed to the Plan requirement of access to corrected data at T+5, would provide more benefit to market analysis and research by regulators. As such, the Commission continues to believe that CAT Data would provide significant improvements to market analysis and research conducted by regulators.

The Commission notes, however, that changes to the CAT NMS Plan do alter the analysis regarding the benefits for regulators in terms of conducting market analysis and research. In our view, the modifications to the Plan to require the reporting of LEIs for Customers and Industry Members in certain circumstances²²⁶² should result in a greater ability of regulators to conduct analysis and research involving individual market participants.²²⁶³ Specifically, the reporting of LEI would also make it possible to merge CAT Data with other data sources that are currently not part of CAT (e.g., futures and security-based swaps), and this could potentially help with market reconstructions involving these products. Furthermore, more granular clock synchronization requirements for exchanges would mean that regulators could sequence events with greater granularity, which could potentially benefit analysis that requires sequencing events and research surrounding high frequency traders. However, because the Plan no longer contains an open/close indicator for equities, regulators will not be able to distinguish

²²⁶⁰ See Proposing Release, supra note 14, at 45768.

²²⁶¹ Id.

²²⁶² See Sections IV.D.4.a.(4) and IV.D.4.b.(2), supra, for a description of the LEI reporting requirements in the Plan.

²²⁶³ See Section V.E.1.b(5), supra for a discussion of how LEIs can increase the accuracy of identifications; see also SIFMA Letter at 37.

buying activity that covers short positions from buying activity that establishes or increases long positions and, therefore, regulators would not be able to examine, for example, how long particular types of traders hold a short position, as indicated in the Notice.²²⁶⁴

c. Surveillance and Investigations

In the Notice, the Commission explained the reasons for its preliminary belief that the enhanced surveillance and investigations made possible by the implementation of the CAT NMS Plan could allow regulators to more efficiently identify and investigate violative behavior in the markets and could also lead to market participants that currently engage in violative behavior reducing or ceasing such behavior, to the extent that such behavior is not already deterred by current systems.²²⁶⁵ The Commission discussed how potential violators' expected probability of being caught influences their likelihood of committing a violation.²²⁶⁶ If market participants believe that the existence of CAT, and the improved regulatory activities that result from improvements in data and data processes, increase the likelihood of regulators detecting violative behavior, they could reduce or eliminate the violative activity in which they engage to avoid incurring the costs associated with detection, such as fines, legal expenses, and loss of reputation. Such a reduction in violative behavior would benefit investor protection and the market as

²²⁶⁴ See Notice, supra note 5, at 30696.

²²⁶⁵ Id. at 30697–99.

²²⁶⁶ It is well established in the economics and political science literature that common knowledge among market actors can lead to the deterrence of behaviors. See, e.g., Schelling, Thomas, "The Strategy of Conflict: Prospectus for a Reorientation of Game Theory," Journal of Conflict Resolution, Vol. 2 No.3 (1958) and Ellsberg, Daniel, "The Crude Analysis of Strategic Choices," American Economic Review, Vol. 51, No. 2 (1961). Therefore, market participants with knowledge of improvements in the efficiency of market surveillance, investigations, and enforcement, and consequently the increased probability of incurring a costly penalty, could be deterred from participating in violative behavior.

investors would no longer bear the costs of the violative behavior that would otherwise exist in the current system. Many of the improvements that would result from CAT could also allow regulators to identify violative activity, such as market manipulation, more quickly and reliably, which could improve market efficiency by deterring market manipulation and identifying and addressing it more quickly and more often when it occurs.²²⁶⁷

The Commission received several comments on the potential benefits of the CAT NMS Plan to improve SRO surveillance, risk-based examinations, enforcement activity, and the process for evaluating tips and complaints; and the Participants also responded to some of the comments raised in the comment letters. As discussed below, the Commission is not changing its analysis and conclusions in light of these comments and the Participants' responses; however, changes to the Plan affect the analysis that the Commission laid out in the Notice.

(1) SRO Surveillance

Rule 613(f) requires SROs to implement surveillances reasonably designed to make use of the CAT Data.²²⁶⁸ Further, data improvements resulting from the Plan would improve regulators' ability to perform comprehensive and efficient surveillance. As the Commission explained in detail in the Notice, these benefits would encompass a number of improvements including: detection of insider trading; surveillance of principal orders; and cross-market and

²²⁶⁷ The Plan would allow regulators to more efficiently conduct cross-market and cross-product surveillance relative to surveillance using current data sources, and the requirement that data be consolidated in a single database would assist regulators in detecting violative (but not obvious) activity. To the extent that market participants are aware of the current challenges to regulators in performing cross-market surveillance and aggregating data across venues, and to the extent that they believe that their violative behavior is more likely to be detected if regulators' ability to perform those activities improves, they may reduce or eliminate violative behavior if the CAT Plan is approved. See Notice, supra note 5, at Section IV.E.2.c(1).

²²⁶⁸ 17 CFR 242.613(f).

cross-product surveillance; and other market surveillance activities, which are each described in more detail below.

First, the Commission noted that CAT Data would include additional fields not currently available in data used for surveillance. Since currently available data does not include customer identifiers, SROs performing insider trading and manipulation surveillance are unable to identify some suspicious trading²²⁶⁹ and must undertake multiple steps to request additional information after identifying suspect trades. The inclusion of Customer-IDs in the CAT would significantly improve these surveillance capabilities. The ability to link uniquely identified customers with suspicious trading behavior would provide regulators with a better opportunity to identify the distribution of suspicious trading instances by a customer as well as improve regulators' ability to utilize customer-based risk assessment.

Second, the Commission noted that some current data sources used for SRO surveillance exclude unexecuted principal orders, limiting the surveillance for issues such as wash sales. As a result, many surveillance patterns are unable to detect certain rule violations involving principal orders. The inclusion of principal orders of Industry Members in the CAT would therefore enable regulators to better identify rule violations by broker-dealers that have not previously had to provide audit trail data on unexecuted principal orders.

²²⁶⁹ The Commission understands that SRO surveillances on topics such as insider trading and market manipulation do not incorporate data that identifies customers. Based on alerts from their surveillances, SROs may open a review that runs through several stages of data requests before identifying a customer. The Commission notes that SRO audit trails typically do not provide customer information but a recent FINRA rule change would require its members to report to OATS non-FINRA member customers who are broker-dealers. See Notice, *supra* note 5, at 30697.

Third, the Commission noted that the Plan would improve regulators' efficiency in conducting cross-market and cross-product surveillance, and enable any regulator to surveil the trading activity of market participants in both equity and options markets and across multiple trading venues without data requests. Regulators would also have access to substantially more information about market participants' activity,²²⁷⁰ and the requirement that the data be consolidated in a single database would assist regulators in detecting activity that may appear permissible without evaluating data from multiple venues.²²⁷¹ The Commission explained that because market data are fragmented across many data sources and because audit trail data lacks consistent customer identifiers, regulators currently cannot run cross-market surveillance tracking particular customers.²²⁷² Furthermore, routine cross-product surveillance is generally not possible with current data. The Commission concluded that the potential enhancements in market surveillance enabled by the CAT NMS Plan are likely to result in more capable and efficient surveillance which could reduce violative behavior and protect investors from harm.

²²⁷⁰ For example CAT Data would include Customer information, subaccount allocation information, exchange quotes, trade and order activity that occurs on exchanges, trade and order activity that occurs at broker-dealers that are not FINRA members, and trade and order activity that occurs at FINRA members who are not currently required to report to OATS. In addition CAT Data would require reporters to report data in milliseconds and would be directly available to non-FINRA regulators much faster than OATS is currently available to them. *Id.* at 30698.

²²⁷¹ See Section V.E.2.c(3), *infra*. The Commission notes that while this is a benefit allowed by consolidation of data in the Central Repository, linked data would not be available in the Central Repository until T+5, which may delay the completion of surveillance activities.

²²⁷² As noted above, SROs currently do not conduct routine surveillance that tracks particular customers because data currently used for surveillance does not include customer information.

Two commenters stated that the Commission is overly optimistic as to the benefits that the Plan would provide to SRO surveillance activities,²²⁷³ with one of the commenters also mentioning that the Commission is overly optimistic with respects to the benefits to surveillance.²²⁷⁴ One of the commenters argued that benefits are exaggerated because the Plan lacks an analytical framework embedded in its design.²²⁷⁵ The same commenter mentioned that the lack of an analytical framework embedded in the design of CAT reduces the ability to identify false positives (i.e., detection of behaviors that are not violative), and false negatives (i.e., not detecting behaviors that are violative).²²⁷⁶ The commenter also specifically raised concerns that the current accessibility and functionality requirements of CAT Data would be rendered unusable for regulators because the methods for querying data and performing bulk extracts are “generic” and not fit for financial market surveillance.²²⁷⁷

Two commenters stated that CAT should encompass real-time reporting functionality, because without it, it is hard to conduct meaningful surveillance.²²⁷⁸ Additionally, one commenter mentioned that the Plan does not provide details on how regulators would use CAT Data.²²⁷⁹

The Participants responded to these comments and noted that they already have real-time surveillance and monitoring tools in place for the respective markets that will not be affected by

²²⁷³ Anonymous Letter I at 3; Data Boiler Letter at 33.

²²⁷⁴ Data Boiler Letter at 33.

²²⁷⁵ Data Boiler Letter at 33.

²²⁷⁶ Data Boiler Letter at 33.

²²⁷⁷ Data Boiler Letter at 13, 27.

²²⁷⁸ Data Boiler Letter at 30; Better Markets Letter at 6–7.

²²⁷⁹ SIFMA Letter at 32.

CAT.²²⁸⁰ Furthermore, the Participants noted that the Plan Processor will provide sufficient data access tools as well as analytical tools in the CAT for the Participants to satisfy their obligations as set forth in Rule 613(f).²²⁸¹ But the Participants did note that surveillance methods and techniques could vary over time and across Participants,²²⁸² potentially yielding some degree of uncertainty in how benefits to surveillance activities would accrue to SROs, investors and market participants. The Participants also noted that CAT is not intended to be the sole source of surveillance for each Participant, and therefore, would not cover all surveillance methods currently employed by the Participants.²²⁸³

The Commission considered these comments and the Participants' responses and believes that they would not warrant changes to the Commission's preliminary conclusions of the benefits that the Plan would provide to SRO surveillance. But the Commission does acknowledge that there is some uncertainty particularly regarding how exactly the SROs will incorporate CAT into their surveillance activities. First, while the Commission agrees that surveillance methods differ across Participants and this could generate uncertainty in the benefits, the Commission disagrees with the commenters that stated that the Commission is overly optimistic as to the benefits. Access to CAT Data would result in substantial benefits to SRO surveillance for the reasons mentioned earlier in this Section, none of which are undermined by the comments. Second, the Commission disagrees with the commenter that stated that the benefits that would accrue to surveillance are exaggerated due to the Plan's lack of an analytical framework embedded in its

²²⁸⁰ Response Letter I at 31, 43

²²⁸¹ Response Letter I at 42.

²²⁸² Response Letter I at 42.

²²⁸³ Response Letter II at 27.

design. The commenter assumes that if the Plan had an analytical framework, the benefits of CAT would be more realistic. The Commission notes that the Plan does have an analytical framework embedded in its design. The Plan states specifically that the Plan Processor will provide the following analytical framework—namely an API that allows regulators to use analytical tools (e.g., R, SAS, Python, Tableau) and permit regulators to use ODBC/JDBC drivers to access CAT Data.²²⁸⁴ This analytical framework would benefit SROs in conducting surveillance, which would benefit investors and market participants by allowing regulators to more quickly and precisely identify and address a higher proportion of market violations that occur, as well as prevent violative behavior through deterrence. Third, this analytical framework could allow regulators to code computer programs using CAT Data to detect trading patterns indicative of violative behavior. While there might be potential errors in detecting violative behavior using these programs, that is, false positives (detecting non-violative behavior) and false negatives (not detecting violative behavior), having access to more detailed CAT Data in a consolidated source including timestamps, principal orders, non-member activity, and subaccount allocations could minimize those errors. Fourth, the Commission disagrees with the commenter that the methods for querying data and performing bulk extracts are “generic” and not fit for financial market surveillance. The Commission expects these query methods, generic or not, will facilitate the direct access necessary for SROs to build improved surveillances. For instance, the Plan states that CAT will support two types of query interfacing,²²⁸⁵ and specifies that all queries must be able to be run against raw (i.e., unlinked) or processed data, or both.²²⁸⁶

²²⁸⁴ See CAT NMS Plan, supra note 5, at Appendix D, Section 8.2.

²²⁸⁵ Id. at Appendix D, Section 8.1.1.

²²⁸⁶ See Section V.E.1.d(3), supra for additional information.

Furthermore, by using the query interfacing supported by CAT, regulators would be able to directly query Customer-IDs, which could improve the ability for SROs to conduct surveillance, contrary to what the commenter stated.

The Commission considered the comments on real-time surveillance, and understands that from the Participants' response, some SROs already have real-time surveillance. Further, the Commission expects the Plan to improve on SROs' real-time surveillances because the Plan will result in exchanges receiving, even at a later date, additional fields in the Material Terms of the Order, such as special order handling instructions, and additional order events, such as principal orders, that some SROs currently do not have available for any surveillance, real-time or otherwise.²²⁸⁷

Finally, in response to the commenter that claimed the Plan did not provide enough details on how regulators would use CAT Data, the Commission acknowledges that there is uncertainty as to how the SROs will incorporate CAT Data into their surveillance activities. The Commission believes that even if there is uncertainty in this regard, the SROs nonetheless would still be able to conduct "meaningful" surveillance with the opportunity to improve on their current surveillances. In this regard, the Commission notes that Rule 613(f) states that national securities exchanges should create surveillances that are "reasonably designed to make use of consolidated information in the consolidated audit trail."²²⁸⁸ In addition, the Plan will improve the ability of regulators to perform cross-market and cross-product surveillance because

²²⁸⁷ As noted in Section V.D.1.c, this economic analysis considers surveillance to be SROs running processing on routinely collected or in-house data to identify potential violations of rules or regulations.

²²⁸⁸ 17 CFR 242.613(f).

regulators will have direct access to consistent data that includes comprehensive trade and order data in markets for multiple products.

The Commission also notes that the changes to the Plan to require the reporting of LEIs for Customers and Industry Members in certain circumstances²²⁸⁹ should facilitate improved SRO surveillance by enabling SROs to identify traders and their clients with more accuracy.²²⁹⁰ The reporting of LEIs would also make it possible to merge CAT Data with markets not included in CAT at this time (e.g., futures and security-based swaps), which could potentially assist with surveillance activities involving these products. Therefore, the inclusion of LEI for Customers and Industry Members could result in greater benefits to SRO surveillance than those described in the Notice.

(2) Examinations

In the Notice, the Commission discussed its preliminary belief that the availability of CAT Data would also improve examinations by the Commission and SROs and that these improvements would benefit investor protection, and the market in general, by resulting in more effective supervision of market participants.²²⁹¹ The Commission conducted 493 broker-dealer examinations in 2014 and 484 in 2015, 70 exams of the national securities exchanges and FINRA in 2014 and 21 in 2015. In addition, the Commission conducted 1,237 investment adviser and investment company examinations in 2014 and 1,358 in 2015. Virtually all investment adviser examinations and a significant proportion of the Commission's other

²²⁸⁹ See Section IV.D.4.a.(4) and Section IV.D.4.b.(2), supra, for a description of the LEI reporting requirements in the Plan.

²²⁹⁰ See Section V.E.1.b(5), supra, for a discussion of how LEIs can increase the accuracy of identifications; see also SIFMA Letter at 37.

²²⁹¹ See Notice, supra note 5, at 30698–99.

examinations involved analysis of trading and order data. Currently some data that would be useful to conduct risk-based selection for examinations, such as trade blotters, are not available in data sources available for pre-exam analysis.²²⁹² Further, the Commission explained that data available during exams often require regulatory Staff to link multiple data sources to analyze customer trading. For example, some customer identities are present in EBS data, but timestamps are not. To evaluate the execution price a customer received, it is necessary to know the time of the trade to compare the price of the customer's execution with the prevailing market prices at that time, which requires linking the EBS data with another data source that contains trades with timestamps (such as the trade blotter). These linking processes can be labor-intensive and require the use of algorithms that may not link with 100% accuracy.

The Commission explained in the Notice that the expected improvements in the data qualities discussed above would enhance the ability of regulators to select market participants for focused examinations on the basis of risk. Having direct access to consolidated data in the Central Repository would improve regulators' ability to efficiently conduct analyses in an attempt to select broker-dealers and investment advisers for more intensive examinations based on identified risk. Additionally, the Commission discussed its belief that regulators would be able to conduct certain types of exams more efficiently because of the inclusion of Customer-IDs in CAT. Moreover, the clock synchronization provisions of the Plan could aid regulators in sequencing some events more accurately, thereby facilitating more informed exams. The Commission believed that the Plan would allow the data collection portion of examinations to be completed more quickly with fewer formal data requests, and that more efficient examinations

²²⁹² Regulators can obtain detailed equity transaction data by requesting a trade blotter from a particular firm; however, the data would only show the activity of that firm.

would help regulators better protect investors from the violative behavior of some market participants and could reduce examination costs for market participants who would have otherwise faced examinations that are less focused and more lengthy.

One commenter suggested that without “red-flagging” suspicious activities using the commenter’s recommended approach (using real-time analytics),²²⁹³ it would not be possible to facilitate the ability of regulators to conduct risk-based examinations.²²⁹⁴ The same commenter stated that the Commission has an overly optimistic assessment of the economic effects to examinations, mainly due to the Plan lacking an analytical framework embedded in its design.²²⁹⁵ The Participants did not provide a response to this comment.

The Commission considered these comments, but believes that they do not warrant changes to the Commission’s preliminary conclusions of the benefits that the Plan would provide to performing risk-based examinations. First, the Commission disagrees with the commenter that stated “red-flagging” suspicious activity using their recommended approach (using real-time analytics) is the only way to facilitate risk-based examinations. As discussed above, having access to Customer-IDs would assist the Commission in flagging suspicious activity for their risk-based examinations, and assist the Commission in effectively targeting risk-based examinations of market participants who are at elevated risk of violating market rules. Furthermore, the Commission could also conduct more informed risk-based exams under the Plan because enhanced clock synchronization provisions could aid the Commission in

²²⁹³ Part of the commenter’s recommended approach to conducting surveillance involves using sensors to perform real-time analytics over streamed data. See Data Boiler Letter at 10–13.

²²⁹⁴ Data Boiler Letter at 32.

²²⁹⁵ Data Boiler Letter at 33.

sequencing some events more accurately. Second, regarding the commenter who stated that the Commission's assessment of the effects to examinations are optimistic because the Plan lacks an analytical framework, the Commission disagrees with this commenter for similar reasons to those stated above.²²⁹⁶

While the commenters did not provide any additional information that would warrant changes to the Commission's analysis or conclusions as set out in the Notice, changes in the Plan do alter the Commission's preliminary analysis. Requiring CAT Reporters to report their LEI for Customers and Industry Members in certain circumstances²²⁹⁷ should result in a greater ability for regulators to identify traders for the purposes of risk-based examinations.²²⁹⁸ Additionally, more stringent clock synchronization requirements for exchanges should enhance regulators' abilities to sequence events, thereby facilitating more informed risk-based exams. As such, the Commission believes that changes to the Plan could generate additional benefits over and above those stated in the Notice.

(3) Enforcement Investigations

In the Notice, the Commission explained that the improvements in data qualities that would result from the CAT NMS Plan would significantly improve the efficiency and efficacy of enforcement investigations, including insider trading and manipulation investigations.²²⁹⁹ The Commission discussed how more efficient and effective enforcement activity is beneficial to

²²⁹⁶ See Section V.E.2.c(1), supra; supra n.2284.

²²⁹⁷ See Sections IV.D.4.a.(4) and IV.D.4.b.(2), supra, for a description of the LEI reporting requirements in the Plan.

²²⁹⁸ See Section V.E.1.b(5), supra, for a discussion of how LEIs can increase the accuracy of identifications; see also SIFMA Letter at 37.

²²⁹⁹ See Notice, supra note 5, at 30699.

both investors and market participants because it deters violative behavior that degrades market quality and that imposes costs on investors and market participants.

The Commission discussed its expectation that dramatic benefits would come from improvements to the accessibility, timeliness, accuracy, and completeness of the data. First, compiling the data to support an investigation often requires a tremendous amount of time and resources, multiple requests to multiple data sources and significant data processing efforts, for both SROs and the Commission. While SROs have direct access to the data from their own markets, their investigations and investigations by the Commission often require access to the data of other SROs because firms trade across multiple venues. Some enforcement investigations, including those on insider trading and manipulation, require narrow market reconstructions that allow investigators to view actions and reactions across the market. Data fragmentation and the time it takes to receive requested data currently make these market reconstructions cumbersome and time-consuming. The Commission discussed its view that having access to CAT Data would help regulators analyze and reconstruct market events, and could in turn help them detect violative behavior during enforcement investigations.

Second, the Commission explained that it currently takes weeks or longer to process, link and make data available for analysis in an enforcement investigation. Under the CAT NMS Plan, data for an enforcement investigation initiated five days or more after an event would be processed, linked, and available for analysis within 24 hours of a query. The Commission discussed how the enhanced timeliness of data can improve the Commission's chances of preventing asset transfers from manipulation schemes, because regulators could use even uncorrected data (between T+1 and T+5) to detect the manipulation and identify the suspected manipulators.

Third, the Commission explained in the Notice that currently, identifying the activity of a single market participant across the market is cumbersome and prone to error. The inclusion and expected improvement in the accuracy of Customer Identifying Information in the CAT NMS Plan could allow regulators to review the activity of specific market participants more effectively. The Commission also explained that this information would be helpful in identifying insider trading, manipulation and other potentially violative activity that depends on the identity of market participants. Additionally, the Commission explained that improved accuracy with respect to timestamp granularity could increase the proportion of market events that could be sequenced under the CAT NMS Plan. This could yield some benefits in enforcement investigations, including investigations of insider trading, manipulation, and compliance with Rule 201 of Regulation SHO and Rule 611 of Regulation NMS.²³⁰⁰

Finally, the Commission explained that the expected improvements in completeness could also benefit investigations by allowing regulators to observe in a consolidated data source relevant data that are not available in some or all current data sources, including timestamps, principal orders, non-member activity, customer information, allocations, and an open/close indicator, which would identify whether a trade increases or decreases an existing position. This data could be important, for example, when investigating allegations of market manipulation or cherry-picking in subaccounts.

One commenter agreed that the CAT Plan would slightly improve the efficiency of regulators' enforcement activities because CAT will save them multiple trips to request data

²³⁰⁰ Benefits associated with the ability to sequence events may be limited in some cases because many order events would not be able to be sequenced completely with the standards established in the CAT NMS Plan. See Section V.D.2.b(2)B.i, supra.

from financial institutions;²³⁰¹ however, this commenter argued that such benefits would be minimal because they do not help to identify misconduct and/or recognize patterns of market manipulation in real-time.²³⁰² The commenter mentioned that the CAT Plan would not effectively and efficiently deter violative behavior, thereby only resulting in marginal improvements to enforcement.²³⁰³ The Commission also received a comment stating that the Plan is overly-focused on best execution, which requires parsing bid and offer information on a minute scale, and that this may overwhelm the system and thereby prevent the capture of relevant information and frustrate the generally stated goals of CAT.²³⁰⁴ One commenter also stated that the Commission is overly optimistic with respect to the benefits of CAT to enforcement activity, mainly due to the Plan lacking an analytical framework embedded in its design.²³⁰⁵ The Participants did not specifically provide a response to the commenters' concerns.

The Commission considered these comments and believes that they do not warrant changes to the Commission's preliminary conclusions of the benefits that the Plan would provide to enforcement investigations. First, while the Commission acknowledges that CAT Data will not assist the Commission in recognizing patterns of market manipulation in real-time, the Commission nonetheless believes that the benefits of CAT Data to performing enforcement activities relative to the Baseline are significant. For instance, Customer Identifying Information in CAT Data would be particularly helpful in identifying a single market participant across the

²³⁰¹ Data Boiler Letter at 32.

²³⁰² Id.

²³⁰³ Id. at 33.

²³⁰⁴ Anonymous Letter I at 3.

²³⁰⁵ Data Boiler Letter at 33.

market, which would be useful in identifying insider trading, manipulation and other potentially violative activity that depends on the identity of market participants. Second, in light of the comment on best execution, the Commission believes that while the Plan will facilitate enforcement of best execution, including on Rule 611, this will not prevent the Plan from improving regulators' ability to investigate other types of violations, including market manipulation and insider trading. Furthermore, by parsing information on a granular scale, the Commission believes that the CAT Plan would increase the proportion of events that can be sequenced, yielding benefits in enforcement investigations. Third, regarding the commenter who stated that the Commission's assessment of the effects to enforcement investigations are optimistic because the Plan lacks an analysis framework, the Commission disagrees with this commenter for similar reasons to those stated above.²³⁰⁶

While the Commission is not altering its analysis of the benefits in response to the comments it received, the Commission is updating its analysis to recognize modifications to the Plan. Requiring CAT Reporters to report LEIs for Customers and Industry Members in certain circumstances²³⁰⁷ should result in a greater ability for regulators to identify traders for the purposes of enforcement activity.²³⁰⁸ This potentially improved data completeness could result in greater benefits to enforcement than stated in the Notice. Benefits to data completeness could also be potentially diminished by Plan modifications that remove the open-close indicator for equities and Options Market Makers. Such information would have been useful in detecting

²³⁰⁶ See Section V.E.2.c(1), supra; supra n.2284.

²³⁰⁷ See Sections IV.D.4.a.(4) and IV.D.4.b.(2), supra, for a description of the LEI reporting requirements in the Plan.

²³⁰⁸ See Section V.E.1.b(5), supra, for a discussion of how LEIs can increase the accuracy of identifications; see also SIFMA Letter at 37.

certain market manipulations and violations of rules such as Rule 105, short sale marking rules, and Rule 204 in equities and in identifying whether options market makers engage in aggressive risk-taking trading. The Commission now notes that due to the elimination of the requirement to report an open/close indicator for equities and Options Market Makers as part of CAT, these benefits will no longer be realized. However, the Commission is approving the Plan with this modification for the reasons discussed in Section IV.D.4.c, above. With regards to modifications to the timestamps on Allocation Reports, the Commission now understands that allocations are conducted after a trade and that the allocation time can aid regulators in ways that do not require millisecond-level timestamps. Therefore, modifications to the Plan that now require second-level timestamps would not result in a significant loss of benefits to the Commission. In spite of these modifications to the Plan, the Commission nonetheless believes that the efficiency and efficacy of enforcement investigations will be improved to a greater degree than anticipated in the Notice.

(4) Tips and Complaints

In the Notice, the Commission explained why it believed that the CAT NMS Plan, would improve the process for evaluating tips and complaints by allowing regulators to more effectively triage tips and complaints, which could focus resources on behavior that is most likely to be violative.²³⁰⁹ Specifically, the availability of CAT Data would drastically increase the detail of data available to regulators for the purposes of tip assessment. This would assist the SROs and Commission in identifying which tips and complaints are credible, would help ensure

²³⁰⁹ See Notice, supra note 5, at 30699; see also SEC Office of the Whistleblower, What Happens to Tips, available at <https://www.sec.gov/about/offices/owb/owb-what-happens-to-tips.shtml>.

that regulators open investigations or examinations on credible tips and complaints, and would limit regulatory resources spent on unreliable tips and complaints.

The Commission did not receive any comments regarding the benefits that would accrue to investors with regards to how regulators respond to tips and complaints. However, changes to the Plan affect the Commission's analysis from the Notice; namely, requiring LEI reporting; enhanced clock synchronization requirements for exchanges; less granular timestamps for allocation reports; and removing the open/close indicator for equities and for Options Market Makers. As discussed above in Sections V.E.2.c.(2) and (3), these changes could affect risk based examinations and enforcement investigations, and could thereby affect the ability of regulators to effectively triage tips and complaints. In light of these modifications to the CAT NMS Plan, the Commission continues to believe that benefits would accrue to regulators allowing them to more effectively triage tips and complaints by focusing resources on behavior that is most likely to be violative, thereby resulting in benefits that would also accrue to investors and market participants.

3. Other Provisions of the CAT NMS Plan

In the Notice, the Commission noted that there are a number of provisions of the CAT NMS Plan that provide for features that are uniquely applicable to a consolidated audit trail or otherwise lack a direct analog in existing data systems.²³¹⁰ Therefore, rather than analyze the benefits of these provisions as compared to existing NMS Plans or data systems, the Commission analyzed these provisions in comparison to a CAT NMS Plan without these features. The Commission preliminarily believed that these provisions of the CAT NMS Plan would increase

²³¹⁰ Id. at 30699–30708.

the likelihood that the potential benefits of the CAT NMS Plan described above would be realized.

As discussed below, the Commission has revised its analysis in response to comments, the Participants' response, and the Commission's modifications to the Plan.

a. Future Upgrades

In the Notice, the Commission discussed several Plan provisions that seek to ensure that the CAT Data would continually be updated to keep pace with technological and regulatory developments.²³¹¹ For example, the Plan would require that the CCO review the completeness of CAT Data periodically,²³¹² that the Central Repository be scalable to efficiently adjust for new requirements and changes in regulations,²³¹³ and that Participants provide the Commission with a document outlining how the Participants could incorporate information on select additional products and related Reportable Events.²³¹⁴ The Commission preliminarily believed these provisions would allow the CAT to be updated if and when the applicable technologies and regulations change.

²³¹¹ Id. at 30700. Examples of these provisions include, requiring “the Chief Compliance Officer to review completeness of CAT Data periodically;” requiring that “the Central Repository be scalable to efficiently adjust for new requirements and changes in regulations;” and requiring Participants “to provide the Commission with a document outlining how Participants could incorporate information on selecting additional products and related Reportable Events.” Id.

²³¹² See CAT NMS Plan, supra note 5, at Sections 4.12(b)(ii), 6.2(a)(v)(E). The CCO would be required to perform reviews on matters including the completeness of information submitted to the Plan Processor or Central Repository and report findings periodically to the Operating Committee.

²³¹³ Id. at Appendix D, Section 1.1.

²³¹⁴ Id. at Section 6.11. This document is due within six months of the Effective Date of the CAT NMS Plan.

The Commission noted that these provisions are designed to ensure that the Participants consider enhancing and expanding CAT Data shortly after initial implementation of the CAT NMS Plan and that the Participants consider improvements regularly continuing forward. The Commission preliminarily expected that, in addition to these provisions, the CCO review would further facilitate proactive expansion of CAT to account for regulatory changes or changes in how the market operates, or in response to a regulatory need for access to new order events or new information about particular order events. To the extent that the Participants determine that an expansion is necessary and it is approved by the Commission, the Plan's scalability provision promotes the efficient implementation of that expansion such that it could be completed at lower cost and/or in a timely manner.

Taken together, the Commission believed that these provisions could also provide a means for the Commission to ensure that improvements to CAT functionality are considered so as to preserve its existing benefits, or that the expansion of CAT functionality is undertaken in order to create new benefits. The Commission recognized some uncertainty with respect to how effectively these provisions would operate to ensure that improvements to CAT functionality are considered in a way that would maximize the benefits of the Plan, but noted that the Commission does retain the ability to modify the Plan, if such a step becomes necessary to ensure that future upgrades are undertaken as necessary.²³¹⁵ Moreover, the focus on scalability, adaptability, and timely maintenance and upgrades promotes a system that could be readily adapted over time. The Commission preliminarily believed that the provisions outlined above would allow the CAT Data to be continually updated to keep pace with technological and regulatory developments.

²³¹⁵ 17 CFR 242.608.

The Commission received one comment disagreeing that future upgrades would increase the likelihood that potential future benefits would be realized. The commenter stated that the provisions about future upgrades are infrastructure related, rather than quality improvements in the sense of timely insights to regulators.²³¹⁶ Another commenter stated that the proposal for the CCO to be an officer of the CAT LLC as well as an employee of the Plan Processor creates a conflict of interest that would undermine the ability of this officer to carry out his or her responsibilities effectively under the Plan because he or she would owe a fiduciary duty to the Plan Processor rather than the CAT LLC.²³¹⁷ The Commission notes that the Plan accords the CCO certain responsibilities related to future upgrades; for example, as noted above, the CCO is responsible for reviewing the completeness of CAT Data periodically and providing the SEC with a document outlining how the Participants could incorporate information on select additional products and related Reportable Events.²³¹⁸

In response to that comment, the Participants recommended a change to the Plan that would require that the CCO have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation, and that, to the extent those duties conflict with duties the CCO has to the Plan Processor, the duties to the CAT LLC should control.²³¹⁹ As discussed in more detail in the Discussion Section, the Commission agrees with this suggestion and has modified the Plan to incorporate this change.

²³¹⁶ Data Boiler Letter at 34.

²³¹⁷ FSI Letter at 3.

²³¹⁸ The Plan delegates these tasks to the CCO. See CAT NMS Plan, supra note 5, at Sections 4.12(b)(ii), 6.11, 6.2(a)(v)(E).

²³¹⁹ Response Letter I at 17–18.

The Commission has considered the comments received, the Participants’ response, and the modifications the Commission has made to the Plan. The Commission disagrees with the commenter that stated that the future upgrades would not help to provide “timely insights to regulators” because the provisions are “infrastructure related.”²³²⁰ As discussed above, the upgrades should improve the completeness of the CAT Data by potentially allowing for its expansion to include information on select additional products and related Reportable Events, and access to more complete data should improve regulatory activities.²³²¹ Additionally, the required scalability of the Central Repository infrastructure and the mechanism to accept suggested changes from the Advisory Committee and regulators will permit the CAT to meet the needs of the regulators—such as enhancements benefiting their oversight of the markets—and be modifiable and adaptable to future technology changes.²³²²

In response to the comment noting that the proposal for the CCO to be an officer of the CAT LLC as well as an employee of the Plan Processor creates a conflict of interest,²³²³ the Commission notes that the potential for a conflict of interest would create additional uncertainty as to whether the provisions of the Plan requiring the CCO to review the completeness of CAT Data periodically and to provide the Commission with a document outlining how the Participants could incorporate information on select additional products and related Reportable Events will be carried out in a way that will maximize the benefits of the Plan. However, the modification to

²³²⁰ Data Boiler Letter at 34.

²³²¹ See Sections V.E.1.a and V.E.2, supra, for a discussion of how more complete data is expected to improve the analysis and reconstruction of market events, market analysis and research in support of regulatory decisions, and market surveillance, examinations, investigations, and other enforcement functions.

²³²² See Section IV.D.15, supra.

²³²³ FSI Letter at 3.

the Plan requiring the CCO to have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation should reduce that uncertainty. Therefore, the Commission continues to believe that those provisions will allow the CAT to be updated efficiently if and when the applicable technologies and regulations change.

Furthermore, the Plan has been modified to require an annual evaluation of potential technological upgrades based upon a review of technological advancements over the preceding year, drawing on Participants' technology expertise, whether internal or external.²³²⁴ The Plan has also been modified to require an annual assessment of whether any data elements should be added, deleted or changed to the CAT Data. Because these amendments result in more frequent evaluations (compared to biannually), and require the evaluations to review technological advancements as well as the usefulness of the data elements in CAT, these amendments should further allow the Participants to consider the appropriate time to make technological upgrades and decisions regarding the inclusion, deletion or modification of data elements.

In summary, the Commission continues to believe that the Plan provides a means for the Commission to ensure that improvements to CAT functionality are considered so as to preserve its existing benefits, or that the expansion of CAT functionality is undertaken in order to create new benefits.

b. Promotion of Accuracy

In the Notice, the Commission discussed specific Plan provisions designed to generally promote the accuracy of information contained in the Central Repository.²³²⁵ The CCO is required, among other responsibilities, to perform reviews related to the accuracy of information

²³²⁴ See Section IV.D.14, supra.

²³²⁵ See Notice, supra note 5, at 30700–01.

submitted to the Central Repository and report to the Operating Committee with regard thereto,²³²⁶ and there is a special Compliance Subcommittee of the Operating Committee, which is established to aid the CCO with regard to, among other things, issues involving the accuracy of information.²³²⁷ The Plan also contains certain other provisions intended to monitor and address Error Rates.²³²⁸

The Commission discussed its preliminary belief that the provisions were reasonably designed to improve the overall accuracy of CAT Data relative to the exclusion of such provisions. It noted, however, that certain procedures outlined in the Plan might not incentivize all firms to further improve the quality of the data they report. Specifically, because the Plan only discusses penalties or fines for CAT Reporters with excessive Error Rates, the Commission explained that it is not clear what incentive, if any, would be provided to firms with median Error Rates to improve their regulatory data reporting processes, and that this lack of incentive could collectively limit industry's incentives to reduce Error Rates.²³²⁹

In addition, the Commission noted that the Plan includes provisions requiring the establishment of a symbology database that will also foster accuracy. The Commission noted that Participants and their Industry Members will each be required to maintain a five-year running log documenting the time of each clock synchronization performed and the result of such synchronization, and that these requirements should provide a clearer foundation for evaluating the standards set in the Plan upon which future improvements could be considered.

²³²⁶ See CAT NMS Plan, supra note 5, at Section 6.2(a)(v)(E).

²³²⁷ Id. at Section.4.12(b).

²³²⁸ Id. at Appendix C, Section A.3(b).

²³²⁹ See Notice, supra note 5, at 30701.

The Commission received several comments regarding the promotion of accuracy in the Plan. One comment letter stated that there are insufficient incentives provided by the Plan for CAT Reporters to reduce Error Rates.²³³⁰ The commenter did not provide any additional information as to why the existing incentives are insufficient or any specific suggestions to improve the incentives. Another commenter recommended a “positive reinforcement” approach to incentivize the reduction of Error Rates, where firms would be exempted from duplicative reporting systems if their Error Rate for “comparable” data in CAT reaches a certain threshold.²³³¹ In addition, the commenter suggested that customer information fields should be categorized based on the degree of their importance for market surveillance and market reconstruction purposes, so that CAT Reporters can focus on ensuring accuracy of the fields most important for market surveillance.²³³² That commenter seemed to agree that an annual review of error rates would promote accuracy, stating that an annual review is “reasonable.”²³³³ The same commenter also noted that detailed error reporting statistics for CAT Reporters will assist in minimizing the error rate over time.²³³⁴ Another commenter stated their belief that CAT Reporters should have an opportunity to reduce their error rate prior to onboarding on CAT, and furthermore, should receive a grace period before error correction rates are disseminated to

²³³⁰ Data Boiler Letter at 34. The commenter generally suggests an alternative approach to data reporting involving a “dynamic analytical framework” where “sensors directly conduct real-time analytics over streamed data where it was originated.” Id.

²³³¹ FIF Letter at 58.

²³³² FIF Letter at 11, 93.

²³³³ FIF Letter at 57.

²³³⁴ FIF Letter at 52.

regulators.²³³⁵ The commenter stated that such provisions, “would provide them [CAT Reporters] with a window to better understand the data being returned by the CAT, and how it is evaluating data submissions.”²³³⁶ An additional commenter stated that error rate monitoring is an effective way of ensuring firms put in place pre-validation checks, and that such checks can be an effective method of protecting the integrity and accuracy of the data being reported.²³³⁷ The Commission received three comment letters that appeared to support the idea that the annual review of clock synchronization and timestamp standards would promote accuracy.²³³⁸ One commenter noted that the annual review would permit a consideration of “the current state and cost of clock synch technology, and what the current industry practices are regarding adoption of these technologies,”²³³⁹ and a second generally agreed with that observation.²³⁴⁰ A third supported regular review to assess whether the standard might be introducing “noise and/or overly distorted signals.”²³⁴¹ In their response, the Participants stated that with respect to data accuracy, the Participants have included provisions in the Plan to take into account minor and major inconsistencies in customer information. In particular, the Participants noted that Appendix D explains that “[t]he Plan Processor must design and implement procedures and

²³³⁵ SIFMA Letter at 7.

²³³⁶ SIFMA Letter at 7.

²³³⁷ UnaVista Letter at 4.

²³³⁸ FIF Letter at 106; SIFMA Letter at 34; Data Boiler Letter at 21.

²³³⁹ FIF Letter at 106. This commenter recommended that any clock synchronization should stay in place for three years because it is costly to the industry and distributive to the industry to change the standard, and such changes could take two years to implement. Id.

²³⁴⁰ SIFMA Letter at 34.

²³⁴¹ Data Boiler Letter at 21.

mechanisms to handle both minor and material inconsistencies in customer information.”²³⁴²

They also noted that material inconsistencies must be communicated to the submitting CAT Reporter(s) and resolved within the established error correction timeframe.²³⁴³ The Participants stated that the Central Repository also must have an audit trail showing the resolution of all errors.²³⁴⁴ Finally, the Participants noted that they intend to monitor errors in the customer information fields and will consider, as appropriate, whether to prioritize the correction of certain data fields over others.

Another commenter suggested that a CAT Reporter’s performance of pre-validation checks prior to submitting data to the CAT can be an effective way to preserve data integrity and accuracy.²³⁴⁵ In their response, the Participants noted that, in recognition of their potential value in ensuring accurate data submissions, they have discussed with the Bidders various tools that will be made available to CAT Reporters to assist with their data submission, including pre-validation checks.²³⁴⁶

Finally, as discussed in more detail above,²³⁴⁷ another commenter stated that the proposal for the CCO to be an officer of the CAT LLC as well as an employee of the Plan Processor creates a conflict of interest.²³⁴⁸ The Commission notes that the Plan accords the CCO certain responsibilities related to the promotion of accuracy; for example, as noted above, the CCO is

²³⁴² Response Letter I at 22, citing the CAT NMS Plan at Appendix D, Section 9.4.

²³⁴³ Id.

²³⁴⁴ Id.

²³⁴⁵ UnaVista Letter at 4.

²³⁴⁶ Response Letter I at 49.

²³⁴⁷ See Section V.E.3.a, supra.

²³⁴⁸ FSI Letter at 3.

responsible for reviews related to the accuracy of information submitted to the Central Repository and reporting to the Operating Committee with regard thereto. In response to that comment, the Participants proposed a change to the Plan which would require that the CCO have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation.²³⁴⁹ As discussed in more detail in the Discussion Section, the Commission agrees with this suggestion and has modified the Plan to incorporate this change.

The Commission has considered the comments and the Participants' response and is revising its economic analysis as indicated below. In response to the commenter that suggested the prioritization of customer information fields, the Commission notes that it is amending the Plan to require the SROs to submit an assessment of errors in the customer information fields and whether to prioritize the correction of certain data fields over others, within 36 months of Plan Approval.²³⁵⁰ The Commission agrees with the Participants, however, that the provisions of the Plan requiring the Plan Processor to design and implement procedures and mechanisms to handle both minor and material inconsistencies²³⁵¹ in customer information, requiring material inconsistencies to be resolved within the established error correction timeframe, and requiring the Central Repository to have an audit trail showing the resolution of all errors should help to promote accuracy, as well. Nonetheless, the Commission believes that, the assessment will help to identify any unanticipated issues with the accuracy of the customer information fields and, in

²³⁴⁹ Response Letter I at 17–18.

²³⁵⁰ See Section IV.D.4.a.(1), supra.

²³⁵¹ The Plan states that minor inconsistencies, such as variations in road name abbreviations in searches, would be resolved within the Plan Processor. Material inconsistencies, such as two different people with the same SSN, must be communicated to the submitting CAT Reporters and resolved within the error correction timeframe described in Section 2.2.4 of the Plan. See CAT NMS Plan, supra note 5, at D-35.

addition to the provisions discussed in the Notice and summarized above, should promote the overall accuracy of CAT Data.

In response to the commenter that suggested CAT Reporters should have an opportunity to reduce their error rate prior to onboarding on CAT, the Commission agrees and believes that such an opportunity exists during the testing periods, particularly as specified in the amended Plan.²³⁵² The Commission is also amending the Plan to require that the CAT testing environment will be made available to Industry Members on a voluntary basis no later than six months prior to when Industry Members are required to report and that more coordinated, structured testing of the CAT System will begin no later than three months prior to when Industry Members are required to report data to CAT.²³⁵³ The ability to use a testing environment prior to reporting will promote accuracy of data going forward.

In response to the comment noting that the proposal for the CCO be an officer of the CAT LLC as well as an employee of the Plan Processor creates a conflict of interest,²³⁵⁴ the Commission notes that the potential for a conflict of interest would create additional uncertainty as to whether the reviews related to the accuracy of information submitted to the Central Repository and reports to the Operating Committee with regard thereto, both of which are delegated to the CCO under the Plan, will be carried out in a way that will maximize the benefits of the Plan. However, the modification to the Plan requiring the CCO to have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation should reduce that uncertainty.

²³⁵² Id. at Appendix C.

²³⁵³ See Section IV.D.8.a, supra.

²³⁵⁴ FSI Letter at 3.

The Commission also believes that, if they are made available to CAT Reporters, pre-validation checks could promote the accuracy of data in the Central Repository prior to T+5 by reducing errors. However, the Commission notes that the availability of these tools is uncertain.

While the Commission continues to believe that the lack of incentives for firms with median Error Rates to improve their regulatory data reporting processes could collectively limit industry's incentives to reduce Error Rates, the Commission agrees with the commenter that suggested that positive reinforcement with respect to error rates may help promote accuracy.²³⁵⁵ The Commission notes that, as discussed above,²³⁵⁶ the overall elimination of existing data reporting systems will be conditioned on the availability of quality data in CAT, which may incentivize accurate CAT reporting. While the Commission agrees that allowing CAT Reporters to stop reporting to existing data systems on an individual basis according to their error rates would incentivize CAT Reporters to reduce their error rates, the Commission notes that this approach may not promote the accuracy of CAT Data as a whole, because it could entail a division of market data across multiple data sources that would obligate regulators to merge multiple data sources to conduct their regulatory activities. However, as discussed above, the Commission has amended the Plan to require Participants to consider, in their rule filings to retire duplicative systems, whether individual Industry Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy standards. This should provide further analysis regarding whether individual reporting exemptions based on meeting

²³⁵⁵ FIF Letter at 58.

²³⁵⁶ See Section IV.D.9, supra.

data quality standards can incentivize fewer errors while, ensuring that regulators can effectively carry out their obligations using CAT Data.²³⁵⁷

The Commission believes that three additional reports and reviews will further promote lower data error rates by focusing attention on the sources of data errors. First, the Plan has also been modified to require an annual evaluation of how the Plan Processor and SROs are monitoring Error Rates and exploring the imposition of Error Rates based on product, data element or other criteria.²³⁵⁸ By increasing the frequency of the evaluation and specifically including this Error Rate information, this analysis will enable the SROs to better understand the factors that generate Error Rates. Second, the Plan has been amended to require an assessment in connection with any Material Systems Changes to the CAT of its potential impact on the maximum Error Rate.²³⁵⁹ This will facilitate understanding of how a particular Material Systems Change would impact Error Rates and whether to temporarily adjust the Error Rates around that Material Systems Change. Third, the Plan has been modified to require the SROs to provide an assessment of the feasibility, benefits and risks and advisability of permitting Industry Members to have bulk access to their reported data. Such an assessment would provide further information on the tradeoffs of bulk extracts, which could allow Industry Members to more efficiently identify and correct data errors.

²³⁵⁷ Id. (explaining that the Commission is amending Section C.9 of Appendix C of the Plan to require that the Participants consider, in their rule filings to retire duplicative systems, whether individual Industry Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy standards, including, but not limited to, ways in which establishing cross-system regulatory functionality or integrating data from existing systems and the CAT would facilitate such individual Industry Member exemptions).

²³⁵⁸ See Section IV.D.11.c, supra.

²³⁵⁹ See Section IV.D.11.b, supra.

The Plan has also been modified to require a report detailing the SROs' consideration of engaging in coordinated surveillance (e.g., entering into Rule 17d-2 agreements, RSAs or some other approach to coordinate compliance and enforcement oversight of the CAT), within 12 months of Plan Approval.²³⁶⁰ This analysis will promote accuracy by focusing the SROs on ensuring that their members comply with requirements in the Plan.

Other amendments could promote accuracy by promoting finer timestamps and shorter clock offset tolerances. The Plan has been modified so that the SROs should apply industry standards related to clock synchronization based on the type of CAT Reporter, type of Industry Member, or type of system, rather than the industry as a whole. In addition, the Plan has been amended to require that the Plan Processor review clock synchronization standards by type of entity and system type six months after effectiveness of the Plan and on an annual basis thereafter. These amendments to the Plan should focus attention on areas where improvements to the clock synchronization and timestamp standards could improve the accuracy of the data at lower cost.

c. Promotion of Timeliness

In addition to the specific timeliness benefits discussed in the foregoing Sections, in the Notice the Commission discussed some Plan provisions that promote performance of the Central Repository, and that therefore could indirectly improve the timeliness of regulator access to or use of the CAT Data. These are found in capacity requirements for the Plan Processor, disaster recovery requirements to ensure the availability of the system, and in supervision and reporting of timeliness issues.

²³⁶⁰ See Section IV.B.4, supra.

First, the Plan Processor must measure and monitor Latency within the Central Repository's systems, must establish acceptable levels of Latency with the approval of the Operating Committee, and must establish policies and procedures to ensure that data feed delays are communicated to CAT Reporters, the Commission, and Participants' regulatory Staff.²³⁶¹ Second, the Plan Processor must develop disaster recovery and business continuity plans to support the continuation of CAT business operations.²³⁶² Third, the Chief Compliance Officer of the Plan Processor must conduct regular monitoring of the CAT System for compliance with the Plan, including with respect to the reporting and linkage requirements in Appendix D.²³⁶³ Moreover, the Plan Processor must provide the Operating Committee with regular reports on the CAT System's operations and maintenance, including its capacity and performance, as set out in Appendix D.²³⁶⁴

Furthermore, the Commission discussed that one caveat on the foregoing discussion is that system performance would in part be dependent on a series of SLAs to be negotiated between the Plan Participants and the eventual Plan Processor, including with respect to linkage and order event processing performance, query performance and response times, and system availability.²³⁶⁵ As these have not yet actually been negotiated, some of the key timeliness benefits anticipated to accrue from implementation of the Plan could be subject to negotiation.

²³⁶¹ See CAT NMS Plan, supra note 5, at Appendix D, Section 8.3

²³⁶² Id. at Section 6.2(a)(v)(J).

²³⁶³ Id. at Appendix D, Section 6.2(a)(v)(J).

²³⁶⁴ Id. at Appendix D, Section 6.1(o)(i).

²³⁶⁵ Id. at Appendix D, Section 8.5.

The Commission received several comments on the development of disaster recovery and continuity plans. One commenter stated that it is not clear that the current disaster recovery plan would provide uninterrupted access to CAT data in the case of an event that calls for the plan to be activated.²³⁶⁶ Another commenter requested clarification that the bi-annual disaster recovery test of CAT operations at its secondary facility would be conducted twice a year, rather than once every two years.²³⁶⁷ In their response, the Participants clarified that disaster recovery tests would be conducted twice a year.²³⁶⁸

As discussed in more detail above,²³⁶⁹ another commenter stated that the proposal for the CCO to be an officer of the CAT LLC as well as an employee of the Plan Processor creates a conflict of interest.²³⁷⁰ The Commission notes that the Plan accords the CCO certain responsibilities related to the promotion of timeliness; for example, as noted above, the CCO is responsible for conducting regular monitoring of the CAT System for compliance, including with respect to compliance with the timelines for reporting and linkage of the data set out in Appendix D of the Plan, which could help ensure that the CAT Data is made available to regulators in accordance with the timelines discussed in Section V.E.1.d.²³⁷¹ In response to that comment, the Participants proposed a change to the Plan which would require that the CCO have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation. As discussed in more detail in the Discussion Section, the Commission agrees with

²³⁶⁶ SIFMA Comment Letter at 45.

²³⁶⁷ FSI Letter at 5.

²³⁶⁸ Response Letter I at 51.

²³⁶⁹ See Section IV.B.3, supra.

²³⁷⁰ FSI Letter at 3.

²³⁷¹ See CAT NMS Plan, supra note 5, at Appendix D, Section 6.2(a)(v)(J).

this suggestion and has modified the Plan to incorporate this change. The Commission has considered the comments, the Participants' response and the modification to the Plan, and continues to believe that the provisions discussed in the Notice and summarized above promote performance of the Central Repository, and therefore could indirectly improve the timeliness of regulator access to or use of the CAT Data.

In response to the comment noting that the proposal for the CCO to be an officer of the CAT LLC as well as an employee of the Plan Processor creates a conflict of interest,²³⁷² the Commission notes that the potential for a conflict of interest would create additional uncertainty as to whether regular monitoring of the CAT System for compliance, which is the responsibility of the CCO under the Plan, will be carried out in a way that will maximize the benefits of the Plan. However, the modification to the Plan requiring the CCO to have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation should reduce that uncertainty.

In response to the comment regarding the frequency of testing,²³⁷³ the Commission notes that the Participants have clarified that testing will take place twice a year, which will promote the effectiveness of the disaster recovery plan relative to less frequent testing. In response to the comment regarding uninterrupted access to CAT Data in the case of an event that calls for the disaster recovery plan to be activated,²³⁷⁴ the Commission recognizes that regulators may not have uninterrupted access to CAT Data in the event the disaster recovery plan is activated, which may limit the extent to which the disaster recovery plan promotes timeliness relative to a plan

²³⁷² FSI Letter at 3.

²³⁷³ FSI Letter at 5.

²³⁷⁴ SIFMA Letter at 45.

that provided for uninterrupted access. However, the Commission notes that the CAT NMS Plan states that the disaster recovery capability will ensure no loss of data and that a secondary processing site must be capable of recovery and restoration of services within 48 hours, but with the goal of next-day recovery.²³⁷⁵ As noted in the Discussion Section, the Commission also expects that, given the importance of the Central Repository, the Plan Processor will strive to reduce the time it will take to restore and recover CAT Data at a backup site. Further, the Commission's amendment to the Plan to require an annual review of efforts to reduce the time to restore and recover CAT Data at a back-up site should promote timeliness. Specifically, any enhancements with respect to restoration and backup of data resulting from these reviews will help to further ensure that access to CAT Data after an outage would be timely.

d. Operation and Administration of the CAT NMS Plan

In the Notice, the Commission stated its preliminary belief that certain elements of the CAT NMS Plan's governance are uniquely applicable to a consolidated audit trail and that, as compared to a CAT NMS Plan without these features, these provisions of the CAT NMS Plan increase the likelihood that the potential benefits of the CAT NMS Plan would be realized.²³⁷⁶

(1) Introduction

In the Notice, the Commission stated that, in adopting Rule 613, the Commission established certain requirements for the governance of the CAT NMS Plan, stating that those "requirements are important to the efficient operation and practical evolution of the [CAT] and are responsive to many commenters' concerns about governance structure, cost allocations, and

²³⁷⁵ See CAT NMS Plan, supra note 5, at Appendix D, Section 5.4.

²³⁷⁶ See Notice, supra note 5, at 30702.

the inclusion of SRO members as part of the planning process.”²³⁷⁷ Moreover, the Commission did not establish detailed parameters for the governance of the CAT NMS Plan, but rather allowed the SROs to develop specific governance arrangements, subject to a small number of requirements.²³⁷⁸ For those requirements, the Commission stated that the governance provisions identified in the Adopting Release—relating to Operating Committee voting and the Advisory Committee—continue to be important to the efficient operation and practical evolution of the Plan, particularly given that there are a range of possible outcomes with respect to both the costs and benefits of the Plan that depend on future decisions.²³⁷⁹ Further, the way in which the identified governance provisions have been incorporated into the Plan could help facilitate better decision-making by the relevant parties. This, in turn, means that the Commission could have greater confidence that the benefits resulting from implementation of the Plan would be achieved in an efficient manner and that costs resulting from inefficiencies would be avoided.²³⁸⁰

(2) Key Factors Relating to Governance

Two factors identified by the Commission in the Rule 613 Adopting Release as “important to the efficient operation and practical evolution of the [CAT]” are voting within the Operating Committee and the role and composition of the Advisory Committee.²³⁸¹ Specifically, voting thresholds that result in Operating Committee decision-making that balances the ability of minority members to have alternative views considered with the need to move forward when

²³⁷⁷ Id. (quoting the Adopting Release, supra note 14, at 45787).

²³⁷⁸ Id.

²³⁷⁹ Id.

²³⁸⁰ Id.

²³⁸¹ Id. at 30703.

appropriate to implement needed policies can promote achievement of the Plan’s benefits in an efficient manner. Similarly, an Advisory Committee that is balanced in terms of membership size and composition, as well as in its ability to present views to the Operating Committee, can result in better performance of its informational role, and thus more efficient achievement of the benefits of the Plan.²³⁸²

A. Voting

In adopting Rule 613, the Commission stated that “an alternate approach” to voting involving “the possibility of a governance requirement other than unanimity, or even supermajority approval, for all but the most important decisions” should be considered, as it “may be appropriate to avoid a situation where a significant majority of plan sponsors—or even all but one plan sponsor—supports an initiative but, due to a unanimous voting requirement, action cannot be undertaken.”²³⁸³ The Notice states that the Plan generally eschews a unanimous voting threshold, except for three clearly-defined circumstances—and that by contrast “[m]ajority approval of the Operating Committee is sufficient to approve routine matters, arising in the ordinary course of business, while non-routine matters, outside the ordinary course of business, would require a supermajority (two-thirds) vote of the Operating Committee to be approved.”²³⁸⁴ As the Notice discusses, majority voting avoids the hold-out problem of unanimity, but can result in decisions that bear less concern for the interests of the minority members—which in turn may depend on the ease with which a majority coalition can be formed, whether those coalitions are fluid or static, and whether in practice decision-making is collegial

²³⁸² Id.

²³⁸³ Id. at 30703.

²³⁸⁴ Id.

or contentious.²³⁸⁵ The Notice also recognizes that “Participant SROs that are affiliated with one another could vote as a block by designating a single individual to represent them on the Committee,” thereby permitting those individuals to exercise more influence, but still short of control over voting outcomes.²³⁸⁶ And the Notice states that the Plan’s supermajority voting requirement for more important matters represents an intermediate ground between majority and unanimous voting.²³⁸⁷

One commenter stated that it supports the EMSAC recommendations regarding changes to NMS Plan governance, which include limiting NMS Plan provisions requiring a unanimous vote and instead requiring two-thirds supermajority voting for substantive changes, plan amendments, and fees, with a simple majority vote for administrative or technical matters and argued that the recommendations should be included in the CAT NMS Plan.²³⁸⁸ The same commenter also supported the recommendation that would involve “revisit[ing] allocation of voting rights among SROs” to replace the “one vote per exchange registration” model with a model of one vote per exchange family (except if the exchange family has a consolidated market share of 10% or more, then two votes) and recommended that it be applied to the CAT NMS Plan.²³⁸⁹

²³⁸⁵ Id. at 30703–04.

²³⁸⁶ Id.

²³⁸⁷ Id. at 30704.

²³⁸⁸ Fidelity Letter at 7–8; see also EMSAC Recommendation, supra note 693, at 3. The recommendation recognizes changes in the environment with respect to exchange competition. See Transcript, Equity Market Structure Advisory Committee Meeting (April 26, 2016) at 106 (“EMSAC April 26 Transcript”), available at <https://www.sec.gov/spotlight/emsac/emsac-042616-transcript.txt>.

²³⁸⁹ Fidelity Letter at 7–8; see also EMSAC Recommendation, supra note 693 at 3. The recommendation recognizes that the number of exchange licenses that an exchange may

With respect to unanimous voting, the Participants’ response noted that the Plan already significantly limits the use of unanimous voting to three well-defined circumstances, and that the Plan differs from other NMS Plans in this regard.²³⁹⁰ With respect to allocation of voting to exchanges or exchange families, the Participants stated that because each Participant has obligations under Rule 613, each Participant should receive a vote.²³⁹¹ The Participants also noted that this approach is consistent with other NMS Plans.

The Commission has analyzed the comments received and discusses them in turn below, focusing on the CAT NMS Plan, and specifically on the question of whether the governance structure as amended in this Notice would decrease Plan uncertainty for purposes of the Commission’s approval of the CAT NMS Plan.²³⁹²

With respect to voting thresholds, the Commission believes that the CAT NMS Plan already anticipated the need for a voting structure that differs from other NMS Plans in following the Commission’s recommendation to seek an “alternative approach.” The CAT NMS Plan requires unanimous voting only in three specific instances and otherwise relies on supermajority or majority votes,²³⁹³ which the Commission notes is generally consistent with the suggestions

have is related to the flexibility to provide for different pricing arrangements, rather than relating to what is appropriate for NMS Plan voting. See EMSAC April 26 Transcript, supra note 2388, at 106–07.

²³⁹⁰ Response Letter I at 7–8.

²³⁹¹ Response Letter I at 7.

²³⁹² The analysis therefore does not relate to whether changes at a later point to NMS Plan governance more broadly, which could include changes to CAT NMS Plan governance, would be appropriate at such time; see also infra note 2442 and associated text; Section IV.B, supra.

²³⁹³ Unanimous voting is required for: (i) obligating Participants to make a loan or capital contribution to the Company; (ii) dissolving the Company; and (iii) acting by written consent in lieu of a meeting. See Section IV.B.1, supra.

made by the commenters. With respect to allocation of votes, the Commission believes that the exchange family approach could potentially give smaller or unaffiliated exchanges a more significant voice in Operating Committee decision-making, but it is already the case under the Plan that no single exchange family or even pair of exchange families can themselves control voting outcomes, even at a majority voting threshold.²³⁹⁴ Thus, the determinants of whether majority voting would result in adequate attention to the rights of minority members continues to turn on the factors set out in the economic analysis accompanying the Notice.

B. Advisory Committee

The Commission in the Notice further stated that in implementing the requirements of Rule 613—which requires that the Plan designate an Advisory Committee to advise plan sponsors on the implementation, operation, and administration of the Central Repository, and which must include representatives of member firms of the Plan sponsors (broker-dealers)—the Plan requires the Advisory Committee to have diverse membership: a minimum of six broker-dealers of diverse types and six representatives of entities that are not broker-dealers.²³⁹⁵ The Notice elaborates that, given the primary purpose of the Advisory Committee as a forum to communicate important information to the Operating Committee, which the Operating Committee could then use to ensure its decisions are fully-informed, the Plan’s choices in implementing Rule 613 do reflect some tradeoffs.²³⁹⁶ Specifically, one factor in the ability of the Advisory Committee to collect relevant information for the Operating Committee is the quality

²³⁹⁴ See infra note 2811.

²³⁹⁵ See Notice, supra note 5, at 30704. The Notice also makes clear that the “[t]erms of Advisory Committee members would not exceed three years, and memberships would be staggered so that a third of the Committee would be replaced each year.” Id.

²³⁹⁶ Id.

and depth of the expertise, and the diversity of viewpoints, of the Advisory Committee’s membership.²³⁹⁷ The Notice states that the Plan balances these considerations by providing the Advisory Committee with sufficient membership to be able to generate useful information and advice for the Operating Committee, while being at a sufficiently low size and diversity level to permit the members to be able to work together.²³⁹⁸ Moreover, another factor in the ability of the Advisory Committee to advise the Operating Committee is whether the Advisory Committee, having assembled a diverse set of views, could effectively communicate those views to the Operating Committee.²³⁹⁹ The Notice states that two Plan provisions, relating to the staggering of member terms and the limits on participation of the Advisory Committee under Rule 613, bear on this communication.²⁴⁰⁰ Finally, one other determinant bears on the effectiveness of the Advisory Committee in ensuring that the Operating Committee makes decisions in light of diverse information—whether the Operating Committee actually takes into account the facts and views of the Advisory Committee before making a decision.²⁴⁰¹ Here, the Notice states that the Plan does not contain a mechanism to ensure that the Operating Committee considers the views of the Advisory Committee.²⁴⁰²

2397

Id.

2398

Id.

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Id.

2400

Id. at 30705. The Notice clarifies that staggering of terms could “enhance the cohesion of the Advisory Committee, and thereby its effectiveness in communicating member viewpoints to the Operating Committee.” But, “the Operating Committee members may exclude Advisory Committee members from Executive Sessions.” Id.

2401

Id.

2402

Id. Such a mechanism could include, per the Notice, “requiring the Operating Committee to respond to the Advisory Committee’s views, formally or informally, in advance of or following a decision by the Operating Committee.” Id.

A number of commenters raised concerns about the extent of input from entities other than plan sponsors into the governance of the Plan. Several of these commenters cited what they perceived to be governance shortcomings with other NMS Plans that have a governance structure similar to that of the CAT NMS Plan — *i.e.*, those that also have an Operating Committee limited to SRO members, and an Advisory Committee for generating input from a broader set of interested parties.²⁴⁰³ In addition to generalized concerns about Advisory Committees having a lack of “visibility,” “voice,” or “authority,”²⁴⁰⁴ commenters raised a number of ways in which they believe Advisory Committees’ ability to provide effective input into Operating Committees’ decision-making has been limited: executive sessions of Operating Committees are overused to exclude Advisory Committee participation;²⁴⁰⁵ robust information-sharing was not practiced;²⁴⁰⁶

²⁴⁰³ SIFMA Letter at 25 (“The existing governance structure for other NMS Plans, which is being imported into the Plan, is ineffective and will provide broker-dealers with no meaningful participation in the development or operation of the CAT.”); Fidelity Letter at 7 (noting that the Plan’s governance structure is similar to that of other NMS Plans, which structure has largely been unchanged since the 1970s, despite significant market changes; stating that “we do not believe that the governance structure in the Proposed Plan permits CAT Advisory Committee members an opportunity to participate meaningfully in the implementation, operation, and administration of the CAT”); KCG Letter at 7 (“Feedback related to the administration and operation of other NMS Plans . . . indicates that Advisory Committee members have limited visibility into the actions of the Operating Committee and almost no voice in the operation [of the] NMS Plan”); ICI Letter at 10 (“[T]he governance structure . . . , similar to other NMS plans, deprives a broad range of market participants, including registered funds and their advisers, of any meaningful voice in plan operations”). *Cf.* DAG Letter at 3 (noting that Industry’s experience as a part of the CAT’s DAG was that “SROs limited the Industry’s participation in important aspects of the development process”); STA Letter at 1 (seconding the DAG Letter’s conclusions).

²⁴⁰⁴ SIFMA Letter at 26; KCG Letter at 7; ICI Letter at 10; Fidelity Letter at 7.

²⁴⁰⁵ SIFMA Letter at 26 (“[T]he SROs have a long history of conducting all meaningful NMS Plan business in executive session, from which Advisory Committee members are excluded.”); Fidelity Letter at 7; KCG Letter at 7.

and other similar obstacles.²⁴⁰⁷ These and other commenters expressed the view that voting representation for certain types of entities²⁴⁰⁸ on the Plan’s Operating Committee was necessary to promote fully-informed and high-quality decision-making,²⁴⁰⁹ to enhance transparency and

²⁴⁰⁶ SIFMA Letter at 26 (“[T]he Operating Committees have refused to share even routine documents.”); *cf.* Fidelity Letter at 7.

²⁴⁰⁷ SIFMA Letter at 26 (citing also the exclusion of Advisory Committee members from meetings of “subcommittees” of the Operating Committee, the circulation of agendas with limited opportunity to prepare views and the requirement that an SRO “sponsor” an agenda item raised by the Advisory Committee, and the absence of a mechanism for an individual member of an Advisory Committee to solicit and represent the views of broader constituencies).

²⁴⁰⁸ SIFMA Letter at 25 (broker-dealers); DAG Letter at 3 (“Industry members”); ICI Letter at 11 (representatives of registered funds and other non-SRO participants); STA Letter at 1 (seconding the DAG Letter); KGC Letter at 6 (broker-dealers); MFA Letter at 3 (“an institutional investor, a broker–dealer with a substantial retail base, a broker-dealer with a substantial institutional base, a data management expert, and . . . a representative from a federal agency experienced with cybersecurity concerns as they relate to national security”).

²⁴⁰⁹ SIFMA Letter at 25 (noting that (1) the CAT is complex and broker-dealer insight will bring perspectives of those who will be doing the bulk of the reporting; (2) broker-dealer participation will ensure the burden of systems changes is shared between broker-dealers and SROs; and (3) broker-dealers will, under the CAT funding model, be expected to bear the vast majority of costs); DAG Letter at 3 (“[F]iltering [Industry] input through SROs, who face a different set of reporting challenges than Industry members, has proven to be an imperfect mechanism for communicating and addressing concerns[;] . . . the Industry remains too far removed from decision-making processes.”); STA Letter at 1 (seconding the DAG Letter); ICI Letter at 11 (stating that “[t]he perspective of other market participants—particularly given that the central repository will house their sensitive information—would help in the development and maintenance of the CAT” and noting further that registered funds’ and their advisers’ views would make the Operating Committee “far better informed” particularly with respect to the impact of CAT on trading and order management practices of funds, and on CAT data security); MFA Letter at 3 (suggesting representation for market participants who will be most significantly impacted by the Operating Committee’s decisions).

mitigate plan sponsor conflicts of interest,²⁴¹⁰ or to ensure adequate incentives exist to drive future improvements to the CAT.²⁴¹¹

Some commenters argued for improving the effectiveness of the Advisory Committee—on its own merits, in addition to changes to the Operating Committee, or as a second-best alternative to Operating Committee changes.²⁴¹² Along these lines, several commenters asserted that the membership of the Advisory Committee should be expanded to include more or additional types of entities.²⁴¹³ Commenters also suggested that the Advisory Committee should

²⁴¹⁰ ICI Letter at 12 (stating that the SROs have an incentive to make regulatory use of and to potentially commercialize the information that they report to the CAT, whereas registered funds would be solely interested in the “security, confidentiality, and appropriate use of all data reported to the CAT”); KCG Letter at 7; MFA Letter at 3–4.

²⁴¹¹ MFA Letter at 4.

²⁴¹² See *infra* n.161–162 & associated text; see also SIFMA Letter at 26 (while stating that the Advisory Committee is not a substitute for direct voting rights, offering comments “in the alternative” on the Plan’s proposed Advisory Committee structure); FIF Letter at 135 (recommending “defining the Advisory Committee to reflect a more participatory, active role in the formulation of decisions and directions being reviewed by the SROs”). *But cf.* KCG Letter at 7 (stating that the Advisory Committee is “not an adequate substitute for providing non-SROs with full voting power on the CAT NMS Plan Operating Committee”).

²⁴¹³ Hanley Letter at 6 (add two financial economists); SIFMA Letter at 27 (“the makeup of the Advisory Committee should include participants with an appropriate representation of firm sizes and business models, such as: inter-dealer brokers, agency brokers, retail brokers, institutional brokers, proprietary trading firms, smaller broker-dealers, firms with a floor presence, and trade associations”—to be selected by broker-dealer representatives, rather than SROs); DAG Letter at 3 (the “Advisory Committee should have a strong Industry contingent and [] this contingent should be formed prior to the approval of the plan”); STA Letter at 1 (seconding the DAG Letter); FIF Letter at 135–136 (“the composition of the Advisory Committee should be widened to 20 participants with a minimum of 12 broker-dealer firms represented”; “[c]ategories of participants that should be added are trade processing and order management service bureaus, as well as the industry associations, such as FIF and SIFMA”); ICI Letter at 12 (“more investor representation, including representation from registered funds” and clarify that existing slot for “institutional” investor would include “advisers to registered funds”); Reuters at 6 (add service bureau representation; service bureaus can offer the view of multiple of their

be involved in every aspect of CAT decision-making, with procedural protections put in place to ensure a robust role for the Advisory Committee in the operation and administration of the CAT.²⁴¹⁴ Finally, some commenters called for additional enhanced governance features, such as independent directors, an audit committee, or publicly-released financial and other disclosures.²⁴¹⁵

audit trail reporting clients); see also Fidelity Letter at 7 (recommending adoption of the EMSAC recommendations, which includes nomination of new candidates for Advisory Committee membership by the Advisory Committee, to be confirmed by a majority vote of the Operating Committee).

²⁴¹⁴ SIFMA Letter at 27–28 (stating that the role of the Advisory Committee must include every aspect of the CAT, including every discussion and meeting of the Operating Committee, and every key issue; procedural safeguards would include (1) establishing written criteria for, and written justifications for invoking, executive sessions, (2) written responses to or documentation for any rejection by the Operating Committee of a written recommendation of the Advisory Committee, (3) circulation of agendas and documentation with sufficient time to prepare for meetings, and (4) broad access by Advisory Committee members to information regarding the performance of the central repository); ICI Letter at 13 (stating that the CAT NMS Plan should include (1) a requirement that the Operating Committee respond in writing to Advisory Committee recommendations, (2) a right for the Advisory Committee to have broad access to documents, and (3) a right to be present in all discussions about data security, including receiving all reports from the CCO and CISO that the Operating Committee receives); Reuters at 7 (stating that the Advisory Committee should have input on Plan amendments that impact CAT Reporters, as well as on decisions on “funding and other aspects of CAT operations”); Fidelity Letter at 7 (supporting changes to Advisory Committee structure proposed by the EMSAC). Cf. DAG Letter at 3 (the Advisory Committee’s Industry contingent should be formed prior to the approval of the Plan to permit the Advisory Committee to provide input to the selection of the Processor and developing Operating Procedures); FIF Letter at 136–37 (an active and collaborative Advisory Committee is necessary to ensure a high-quality CAT; the scope of the Advisory Committee should include the CAT System in addition to the Central Repository; and the Advisory Committee should have input into all amendments—material and non-material (with material amendments redefined to include “External Material Amendments” and “Internal Material Amendments”); NYSE Letter at 4–6.

²⁴¹⁵ SIFMA Letter at 29 (requesting that the CAT be operated at-cost, with fully transparent, publicly-disclosed annual reports, audited financial statements, and executive compensation disclosure; an audit committee should ensure that revenue is used for regulatory purposes — these would be appropriate to the “regulatory undertaking” and

One commenter objected wholesale to the governance structure of the Plan, asserting that the “governance of the CAT must not be riddled with conflicts of interest” and that therefore the CAT should either be controlled entirely by the Commission, or that the CAT governance structure should be radically altered, in order for it to be more consistent with the public interest and the SEC’s mission.²⁴¹⁶

On the other hand, one commenter expressed a view that the CAT NMS Plan’s governance structure, including the provision limiting Operating Committee voting membership to Plan sponsors, was appropriate, given that Rule 613 places the responsibility for creating and maintaining the CAT NMS Plan on the Plan sponsors,²⁴¹⁷ and that the Plan sponsors, as SROs,

“industry utility” that the CAT should be, with SROs’ regulatory decisions “made outside the governance and operation of the CAT itself”); DAG Letter at 3 (calling for the CAT governance structure to include independent directors (with both non-Industry and Industry participants) and a majority-independent audit committee); STA Letter at 1 (seconding the DAG Letter).

²⁴¹⁶ Better Markets Letter at 4–6 (with respect to the latter option, the CAT would need to be a not-for-profit, led by a Board with a supermajority of independent directors (including an independent Chair), and with SEC representation, with ultimate SEC control over the access to and usage of the CAT).

²⁴¹⁷ NYSE Letter at 4–5 (citing the Commission’s statement in the Adopting Release that the structure of the Operating Committee and the Advisory Committee, including the ability of the Operating Committee to meet in executive session, “appropriately balances the need to provide a mechanism for industry input . . . against the regulatory imperative that the operations and decisions regarding the [CAT] be made by SROs who have a statutory obligation to regulate the securities markets, rather than by members of the SROs, who have no corresponding statutory obligation . . .”). But cf. KCG Letter at 6 (stating that the SRO-only Operating Committee is “contrary to the public interest and fails to recognize the CAT system as a core market utility meant to benefit all market participants”).

are subject to obligations under Rules 608 and 613, as well as Section 6(b)(1) and 15A(b)(2) of the Exchange Act—obligations to which Advisory Committee members are not subject.²⁴¹⁸

In their responses, Participants responded to many of the concerns raised by the commenters. First, the Participants stated that the composition of the Operating Committee is consistent with Rule 613, and including non-SROs on the Committee could give rise to conflicts of interest as entities that are the subject of market surveillance would be given a role in determining how such market surveillance would operate.²⁴¹⁹ Moreover, the Advisory Committee would provide non-SROs with an “appropriate and meaningful forum” in which to make their views known.²⁴²⁰

With respect to the Advisory Committee, the Participants agreed with certain commenters who had called for additional entities to be added to the membership of the Advisory Committee, and therefore proposed a Plan amendment to add a service bureau representative, along with an additional institutional investor representative (while requiring one of the three institutional investor representatives to represent registered funds).²⁴²¹ However, the Participants disagreed with adding financial economists, as there is already an academic who could be a financial economist; trade groups, as there are already individual members thereof represented; or additional broker-dealers, as there are already several representatives from different segments of the industry — and adding so many additional people would “likely hamper, rather than

²⁴¹⁸ Id. at 6 (the latter are the obligations to comply, and enforce its members’ compliance with, the Exchange Act).

²⁴¹⁹ Response Letter I at 6.

²⁴²⁰ Id. at 7.

²⁴²¹ Id. at 9–10.

facilitate, discussion.”²⁴²² With respect to the appointment of Advisory Committee members, the Participants rejected the suggestion that the broker-dealer members of the Advisory Committee be permitted to make appointments, but determined to amend the Plan to provide the Advisory Committee an opportunity to advise the Operating Committee on candidates before the Operating Committee makes an appointment.²⁴²³

With respect to the activities of the Advisory Committee, the Participants stated that the existing structure provided under Rule 613 already provides the Advisory Committee with an appropriate, active role in governance, and that no changes are needed.²⁴²⁴ Similarly, the Participants did not believe that a change to provisions governing consideration of Material Amendments was necessary to provide the Advisory Committee with a more robust role.²⁴²⁵

With respect to the additional procedural protections for the effectiveness of the Advisory Committee, the Participants asserted that, first, with respect to Executive Sessions, Rule 613 and the Plan strike the right balance, as the Plan Participants need the opportunity to discuss certain matters, including certain regulatory and security issues, without the participation of the industry, and that maintaining flexibility in determining when to meet in Executive Session is important. But Participants nonetheless clarified that they intend to limit Executive Sessions to “limited purposes requiring confidentiality.” Second, Participants asserted that similarly the right balance

²⁴²² Id. at 10–11.

²⁴²³ Id. at 13–14.

²⁴²⁴ Response Letter I at 13. The Participants also declined to form the Advisory Committee prior to the approval of the Plan in response to the commenter who wanted the Industry contingent to the Advisory Committee to be formed early to have input on selection of the Plan Processor and the formation of operating procedures, stating that they have, and will continue, to engage with the DAG in order to receive the views of industry members prior to the approval of the Plan. Id. at 16–17.

²⁴²⁵ Id. at 19–20.

has been struck with respect to the treatment of Advisory Committee requests and recommendations, as the commenters' proposed procedural protections are formulaic, and could hamper interactions.²⁴²⁶ The Participants also affirmed their belief that "as a matter of good corporate governance, the Operating Committee should take into consideration the Advisory Committee's input regarding the CAT."²⁴²⁷

Finally, with respect to the other governance features requested by commenters, the Participants declined to make any changes. With respect to independent directors, according to Participants, the composition of the Operating Committee as set forth in the Plan is consistent with Rule 613, and adding independent directors is unnecessary, given existing independent representation on SRO boards.²⁴²⁸ Moreover, they asserted that an audit committee is unnecessary, because the CAT will operate on a break-even (versus for-profit) basis, the Operating Committee members can act objectively, and the Compliance Subcommittee can aid the CCO in much the same way as an independent audit committee would.²⁴²⁹ Finally, the Participants noted that financial transparency is accomplished through Advisory Committee members' right to access information about the operation of the CAT and their receipt of minutes

²⁴²⁶ Id. at 14–16. The purposes requiring confidentiality for which an Executive Session could be appropriate were further elaborated as including "(1) matters that present an actual or potential conflict of interest for Advisory Committee members (e.g., relating to Industry Members' regulatory compliance); (2) discussion of actual or potential litigation; (3) CAT security issues; and (4) personnel issues." Id. at 15.

²⁴²⁷ Id. at 15–16. Response Letter I did not directly address the comments regarding agenda timing, or broad informational access.

²⁴²⁸ Id. at 7.

²⁴²⁹ Id. at 8–9. However, Participants also stated that the Operating Committee could decide to add an audit committee at a later date. Id. at 9.

from meetings; also, financial information related to the CAT will be disclosed in fee filings with the Commission.²⁴³⁰

The Commission has considered the comments it received regarding governance issues but believes that the economic benefits and tradeoffs of the CAT NMS Plan governance structure examined in the Notice continue to apply. The Commission in the Notice stated that the governance provisions of the CAT could “help promote better decision-making by the relevant parties” and thereby “could mitigate concerns about potential uncertainty in the economic effects of the Plan by giving the Commission greater confidence that its expected benefits would be achieved in an efficient manner and that costs resulting from inefficiencies would be avoided.”²⁴³¹ While commenters have not raised issues that would cause the Commission to fundamentally reconsider that assessment, commenters have called attention to ways in which they believe NMS Plan governance could be improved to increase the likelihood that the benefits of the plan would be achieved in an efficient manner and that costs resulting from inefficiencies would be avoided. These are discussed in turn below, along with the changes the Participants recommended making to the Plan, and which the Commission has made, in response to certain comments. As above, the discussion is specific to the CAT NMS Plan, and specifically, the question of whether the governance structure as amended would decrease Plan uncertainty for purposes of the Commission’s approval of the CAT NMS Plan.

The Notice did not expressly address the possibility of adding non-SRO members to the Operating Committee, given that the Commission in the Adopting Release for Rule 613 cited the “regulatory imperative” that the operations and decisions regarding the CAT be made by SROs,

²⁴³⁰ Id. at 17.

²⁴³¹ See Notice, supra note 5, at 30705.

who have the statutory obligation to oversee the securities markets.²⁴³² The Commission believes that adding non-SROs to the Operating Committee, as advocated by some commenters, could give rise to the types of tradeoffs that are similar to those the Commission identified in the Notice with respect to expanding or diversifying the Advisory Committee: a larger and more diverse Operating Committee could result in better-informed Operating Committee decision-making, but it could also decrease the ability of Operating Committee members to coordinate effectively in decision making.²⁴³³ In particular, non-SROs may have significantly different interests than SRO members, given that non-SROs lack the statutory obligation to oversee the securities markets, and their inclusion could give rise to potential conflicts of interest or recusal issues if the Operating Committee were to discuss regulatory surveillance issues. Thus, the Commission believes that adding non-SRO members to the Operating Committee at this time would increase rather than decrease the uncertainty around achieving the benefits of the Plan.

Commenters did not challenge the nature of the tradeoffs that apply to the membership of the Advisory Committee, but rather where the particular balance was struck. A larger, more diverse committee as advocated by some commenters could provide additional views that could lead to better-informed decision-making; however, such a committee could also lack cohesion

²⁴³² Id. at 30704.

²⁴³³ Similarly, adding an independent board or audit committee to the Plan's governance structure could provide additional oversight of Plan decision-making and mitigate potential concerns about Plan Participants' conflicts of interest, but it could also decrease coordination in decision-making required for efficiently achieving the regulatory benefits of the Plan. Aside from the potential costs, the incremental benefits of these and other enhanced governance features (e.g., additional disclosure requirements) may be narrow in light of the other provisions discussed in the Notice, including the Commission's ability to monitor whether the benefits of the CAT are being achieved and the provisions limiting the incentive and ability of Operating Committee members to serve the private interests of their employers, including rules regarding recusal of Operating Committee members from voting on matters that raise a conflict of interest. Id. at 30741.

and have difficulty making decisions in a timely manner, which would impede the efficiency of the decision-making process under the CAT NMS Plan.²⁴³⁴ Adding a small number of diverse voices as Participants propose to do in response to comments could enhance the quality of Advisory Committee decision-making by increasing the diversity of views that are represented, but risks decreasing the quality of decision-making by making the Advisory Committee larger and less cohesive. It is difficult to determine where the exact tipping point lies, but the changes the Participants propose making to the Plan we believe would on net increase the quality of Plan decision-making: the value of the additional diverse viewpoints appears likely to justify any additional unwieldiness the two additional members might cause. Along these same lines, the Commission further believes that adding the unique perspectives of a financial economist would also increase the quality of the Advisory Committee discussions without unduly burdening its operations, and the Commission has therefore amended the Plan to add to the Advisory Committee an academic who is a financial economist. However, adding a large number of additional members, or members whose views could be expected to largely coincide with those of existing members, as certain commenters sought, makes it more likely that the marginal benefits of expansion would be outweighed by the increase in coordination difficulties.²⁴³⁵

With respect to the Advisory Committee membership, one commenter suggested that the appointments be made by the broker-dealer members of the Advisory Committee, rather than by

²⁴³⁴ Id. at 30705.

²⁴³⁵ For example, while there are many diverse types of broker-dealers, it is not clear that increasing the number of broker-dealers representatives from 7 to 12 would add significantly to the diversity of views represented on the Advisory Committee, and by constituting a majority of Advisory Committee members, may give rise to a risk that broker-dealer voices would dominate Advisory Committee discussions, which could limit the diversity of views transmitted to the Operating Committee and thereby worsen Plan decision-making.

the Operating Committee; Participants asserted that the Operating Committee should have selection responsibility. The question of who to vest with appointment power embodies certain tradeoffs: increasing the independence of the Advisory Committee by vesting appointment power in Advisory Committee members may promote more diverse or robust presentation of views to the Operating Committee. On the other hand, it increases the possibility that the Advisory Committee would operate in a manner adversarial to the Operating Committee, and could diminish the likelihood that the Operating Committee would be open to persuasion following consideration of the Advisory Committee's views. Moreover, vesting appointment powers solely in the broker-dealer members of the Advisory Committee, as opposed to all members of the Advisory Committee, could result in Advisory Committee membership that overweighs the views of broker-dealers. As a compromise position, the Participants propose to formalize a role for the Advisory Committee in advising the Operating Committee on membership selections. This is not the only compromise position that could balance the interests of SROs and non-SROs and ensure the representation of a diverse set of views to promote well-informed decision-making — for example, one commenter's alternative would provide slightly more power to the Advisory Committee by vesting nominating authority in the Advisory Committee, while providing a veto right to the Operating Committee through the majority vote it would take to confirm a new member. But the Plan, as amended, would promote better-informed decision-making by ensuring the views of existing Advisory Committee members are considered as part of the selection of new members. This should promote membership in the Advisory Committee that is more independent, rather than intellectually-aligned with either the Operating Committee or Advisory Committee (or some subset thereof), and thereby better-able to bring diverse views to the Operating Committee's attention in Plan decision-making.

While, as amended, the Plan would provide a role with respect to Advisory Committee membership selection to the Advisory Committee, the Participants did not propose an additional expansion of the activities of the Advisory Committee, as some commenters had sought. It is not clear that procedural changes such as having the Advisory Committee formally vote on matters that the Operating Committee is voting on, as opposed to a less formal way of providing the Operating Committee with the Advisory Committee's views with respect to those votes, would materially improve Plan decision-making and thereby reduce uncertainty that benefits would be achieved.²⁴³⁶ Similarly, the Plan's current definition of Material Amendment seems appropriately calibrated to bring the most robust decision-making processes to bear on the matters of the greatest importance. Altering the balance to add more process under Section 6.9(c) (i.e., to require affirmative approval by Supermajority Vote (Material Amendments) versus a right of objection vested solely in Participants plus a Majority Vote (non-Material Amendments)) could improve the quality of those decisions by making them better-informed—i.e., by requiring debate and subjecting them to a Supermajority Vote, versus only triggering debate at the option of Participants²⁴³⁷—but the additional delay imposed on decision-making with respect to less significant matters would likely not justify any marginal gains in decisional quality.

²⁴³⁶ Similarly, constituting the industry portion of the Advisory Committee early, so that industry may have a greater voice with respect to selection of the Plan Processor and the operating procedures of the CAT, would not improve Plan decision-making where those views could be solicited from industry via the DAG.

²⁴³⁷ It is not clear the extent to which the Advisory Committee would have the opportunity to have input into a non-Material Amendment during the 10 day window before the non-Material Amendment is deemed approved, but, as noted above in Section IV.B.2, the Commission amendment to the Plan would provide the Advisory Committee with the same information regarding non-Material Amendments as the Operating Committee would have.

Similarly, the Notice discussed several of the issues raised by commenters, including that the Advisory Committee members are permitted to attend Operating Committee meetings but are excluded from Executive Sessions; that the Advisory Committee’s access to information is subject to scope and content determinations made by the Operating Committee; and that there is no mechanism under the Plan to ensure that the Operating Committee does in fact consider the views of the Advisory Committee when engaged in Plan decision-making.²⁴³⁸ Changing any of these features as commenters suggested would pose certain economic tradeoffs. Commenters did not assert that the Advisory Committee system as currently constructed is unable to function appropriately, but rather in their experience that it does not — and therefore that additional protections are needed. Cooperation in good faith under the existing structure of the Plan could ensure that Advisory Committee members have access to the information they need to contribute meaningfully to discussions and that Advisory Committee members’ recommendations are taken seriously; absent good faith cooperation, processes would be needed to promote these outcomes. While additional processes could provide protections, they would also increase inflexibility. Thus, adding formal mechanisms where informal mechanisms would have sufficed would add costs, delay, and lack of adaptability with little or no corresponding benefit.

In their response, Participants stated that they “recognize the benefit and purpose of the Advisory Committee and intend to use the Executive Session for limited purposes requiring confidentiality” and further that “as a matter of good corporate governance, the Operating Committee should take into consideration the Advisory Committee’s input regarding the

²⁴³⁸ See Notice, supra note 5, at 30705.

CAT.”²⁴³⁹ The Commission agrees, and in light of the Participants’ assurances, believes that the protections sought by some commenters are generally not necessary to achieve the Plan’s benefits and could be counterproductive at this time.

However, the Commission is amending the Plan in two ways that respond, at least in part, to certain of commenters’ concerns. First, the Commission is amending the Plan to require that SEC Staff be able to attend Executive Sessions. In addition to the direct oversight benefits that would accrue from SEC Staff attendance at Executive Sessions, SEC Staff would be able to monitor whether Participants are complying with their stated intent of limiting Executive Sessions to purposes requiring confidentiality. The direct and indirect costs of permitting SEC Staff attendance should be low, but potential indirect costs do exist. For example, it may chill the free exchange of ideas in an executive session if the presence of the Participants’ regulator causes the Participants to engage in a less robust conversation, which could diminish the effectiveness of the Plan’s governance. Similarly, the additional imposition on Executive Sessions may prompt the Participants to seek alternative, informal methods of communication and debate outside the formal governance mechanisms established by the Plan, which could ultimately disadvantage Advisory Committee members if decisions are made informally, without the benefit of their input.

Second, the Commission is amending the Plan to require that the Advisory Committee members receive the same materials and information as the Operating Committee receives (absent confidentiality concerns with respect to such information). This new procedural protection will put Advisory Committee members on an equal informational footing with the

²⁴³⁹ Response Letter I at 15–16.

Operating Committee, and should thereby allow the Advisory Committee to produce recommendations that are better-informed. The procedural protection should have low direct costs: it does not require the preparation of new materials but simply the dissemination of information that is already prepared for the Operating Committee. However, there could be indirect costs and tradeoffs. Principally, Operating Committee members who are no longer able to exclude certain materials from dissemination to the Advisory Committee members (e.g., materials that are sensitive in some way but do not fall within the confidentiality exception in the Plan) could choose to withhold such materials entirely, thereby making the Operating Committee's deliberations less well-informed, or they could seek to hold sensitive discussions in a less formal or less well-documented venue, which could pose the same problems as discussed above with respect to SEC presence in Executive Sessions.

With respect to the remaining requested protections for which no Plan amendment is being made, the Commission will be alert to future suggestions that cooperation between the Advisory Committee and the Operating Committee is lacking, and will assess, as appropriate, whether additional procedural protections are needed.

With respect to the additional governance features for which some commenters advocated—an independent board, audit committee, and financial transparency—the economic analysis in the Notice did not specifically discuss these items. The Commission believes that, on balance, commenters advocating for these issues have not raised concerns that would cause the Commission to alter its economic analysis. Having an independent board or audit committee would add an additional layer of complication to Plan decision-making—triangulating among the Operating Committee, Advisory Committee, and the independent board, thereby increasing the likelihood of untimely decision-making. There do not appear to be significant offsetting

benefits at this time, as alternative mechanisms already exist to advance the purposes that these governance enhancements would seek to serve. If the purpose is that there be an external check on potential conflicts of interest, the Advisory Committee can serve in that role, given its ability to receive documents.²⁴⁴⁰ Similarly, to the extent that independent board members or an audit committee could serve a monitoring function, such a monitoring function could already be accomplished through the Compliance Subcommittee that the Plan establishes to aid the CCO.²⁴⁴¹ Because the functions that the additional governance features would fulfill are already performed, at least in some extent, by existing features of Plan governance, adding them does not appear necessary at this time to ensure that the Plan's governance is such that uncertainties under the Plan would be diminished.

With respect to the commenter who advocated a radically different method for Plan governance, where the CAT would be controlled by the Commission to avoid conflicts of interest, the Commission notes that SROs are entrusted with regulatory and oversight responsibilities by the Exchange Act; to the extent their commercial interests create an actual or potential conflict of interest, the Advisory Committee is able to monitor and advise the Operating Committee on Plan decision-making, acting as a counter-weight; and to the extent there are any residual unmitigated conflicts, the Commission has authority to intervene. The Commission

²⁴⁴⁰ In addition, as the Notice makes clear, the Commission can modify the Plan as it may deem necessary or appropriate, and has the right to attend meetings of the Operating Committee, as well as receive specified documents. See Notice, supra note 5 at 30702. The Commission can thus serve as an additional external check on potential conflicts.

²⁴⁴¹ Similarly, the Commission's amendment to the Plan to require that CAT LLC financial statements be prepared in compliance with GAAP and audited by an independent public accounting firm may substitute to a certain extent for the added financial transparency sought by commenters. See CAT NMS Plan, supra note 5, at Section 9.2; see also Section IV.B.4; Participants' Letter II.

believes that the CAT NMS Plan approach to balancing and offsetting the conflicts of interest can achieve the regulatory benefits of the CAT.

At this time, given the analysis above, the Commission believes that the governance structure in the Plan as modified increases the likelihood that the benefits of the Plan will be achieved. The Commission notes that more significant changes to NMS Plan governance structures could potentially produce better overall Plan outcomes, but could also lead to additional coordination problems or have unintended consequences. Thus, while the Commission believes that the reduction in uncertainty relating to the achievement of Plan benefits can at this time best be achieved through the Plan's approach to governance, the Commission will continue to assess the governance of NMS Plans generally and the tradeoffs between the quality and efficiency of the decision-making processes of NMS Plans.²⁴⁴²

Finally, one commenter asserted that the CAT should be administered by a single centralized body from a legal, administrative, supervisory, and enforcement perspective, rather than by nineteen separate SROs.²⁴⁴³ According to that commenter, while the Plan "contains permissive language" that would allow the SROs to enter into agreements with one another, nothing requires the SROs to enter into 17d-2 agreements, Regulatory Services Agreements, or some combination thereof. Thus, SROs could interpret the CAT's requirements differently, or

²⁴⁴² See, e.g., Fidelity Letter at 7–8 ("We also agree that the SEC should engage in formal administrative rulemaking to revise Rule 608 of Regulation NMS to specify that NMS Plans must contain governance provisions consistent with the objectives specified in the EMSAC recommendations . . ."). Cf. ICI Letter at 12 (noting that "every NMS Plan . . . at least should include an advisory committee comprising a broad range of industry participants that lack operating committee representation" (emphasis added)); see also supra Section IV.B.

²⁴⁴³ SIFMA Letter at 29 (suggesting that a single SRO take the lead, and others execute agreements to transfer responsibility for enforcement to that SRO).

apply them to duplicative enforcement, which would be “inefficient and unworkable for firms that are members of several of the SROs.” Coordination, by contrast, “will create efficiencies and avoid regulatory duplication, potential inconsistent interpretations and interpretive guidance, and unnecessary compliance costs.”²⁴⁴⁴ The Participants stated that they recognize the potential efficiencies to be achieved through coordination, and plan to consider a Rule 17d-2 agreement.²⁴⁴⁵ The Commission agrees that coordination of efforts can produce efficiencies, but notes that alternative mechanisms for coordination of efforts, including the Operating Committee, also exist. Requiring delegation of authority to one SRO also would not necessarily lead to a better outcome, if such a one-size-fits-all approach were to inhibit the ability to tailor programs to a particular SRO or its members. However, in light of the potential efficiencies, the Commission believes it important that the Participants consider mechanisms for regulatory cooperation, and has therefore amended the Plan to require a report detailing the Participants’ considerations. Thus, the permissive approach taken in the Plan—where SROs can execute agreements but are not required to do so, particularly where coupled with the Participants’ assertion that they are exploring whether it would in fact be efficient to enter into those agreements and the Plan’s requirement that they report on whether they have done so—still promotes the achievement of the Plan’s regulatory benefits.

(3) Conclusion

In the Notice, the Commission concluded by stating its preliminary belief that the governance provisions discussed therein could help promote better decision-making by the relevant parties and, in turn, could mitigate concerns about potential uncertainty in the economic

²⁴⁴⁴ Id.

²⁴⁴⁵ Response Letter I at 17.

effects of the Plan by giving the Commission greater confidence that its expected benefits would be achieved in an efficient manner and that costs resulting from inefficiencies would be avoided.²⁴⁴⁶ For the reasons discussed above, the Commission continues to believe that this is the case after considering the comments on its analysis, the Participants' response, and modifications to the Plan.

F. Costs

In the Notice, the Commission preliminarily estimated current costs related to regulatory data reporting, anticipated costs associated with building and maintaining the Central Repository, and the anticipated costs to report CAT Data to the Central Repository.²⁴⁴⁷ These preliminary estimates were calculated from information provided in the CAT NMS Plan as amended on February 27, 2015 as well as supplemental information. The Commission discussed the Plan's estimate that the 20 Participants spend \$154.1 million annually on reporting regulatory data and performing surveillance.²⁴⁴⁸ The Notice also reported that the approximately 1,800 broker-dealers anticipated to have CAT reporting responsibilities currently spend \$1.6 billion annually on regulatory data reporting. The Commission estimated that the cost of the Plan would be approximately \$2.4 billion in initial aggregate implementation costs and \$1.7 billion in ongoing annual costs. Furthermore, the Notice discussed that market participants would have duplicative audit trail data reporting responsibilities for a period of up to a maximum of 2.5 years preceding the retirement of potentially duplicative regulatory data reporting schemes. The Commission

²⁴⁴⁶ Id.

²⁴⁴⁷ See Notice, supra note 5, at 30708–30.

²⁴⁴⁸ The number of Participants has changed since the Plan was filed. Adjustments to cost numbers to account for new Participants is discussed in Section V.F.1.b, infra.

estimated that duplicative audit trail data reporting could cost broker-dealers \$1.6 billion per year or more and could cost the Participants up to \$6.9 million per year. The Notice also treated all costs of developing the Plan (estimated at \$8.8 million at the time the Plan was filed) as sunk costs, excluding them from costs to industry if the Plan were adopted.

In the Notice, the Commission discussed its belief, however, that there is significant uncertainty surrounding the actual implementation costs of CAT and the actual ongoing broker-dealer data reporting costs if the Plan were approved. The Commission explained that the methodology and data limitations used to develop these cost estimates could result in imprecise estimates that may significantly differ from actual costs.

In the Notice, the Commission considered which elements of the CAT NMS Plan are likely to be among the most significant contributors to CAT costs.²⁴⁴⁹ The Commission discussed its preliminary belief that significant sources of costs would include the requirement to report customer information, the requirement to report certain information as part of the Material Terms of the Order, the requirement to use listing exchange symbology, and possibly, the inclusion of Allocation Reports.

The Commission also recognized that a number of second-order effects could result from the approval of the Plan.²⁴⁵⁰ These included market-participant actions designed to avoid direct costs of a security breach; changes to CAT Reporter behavior due to increased surveillance; changes in CAT Reporter behavior to switch from one funding tier to another to qualify for lower fees; and changes in broker-dealer routing practices related to fee differentials across

²⁴⁴⁹ Id. at 30730–32.

²⁴⁵⁰ Id. at 30733–34.

Execution Venues. The Commission also recognized that investors and market participants could face significant costs if CAT Data security were breached.²⁴⁵¹

The Commission has considered the comments received, the Participants' response, and the modifications to the Plan, and has updated and revised its analysis of costs accordingly. The Commission's updated cost estimates presented below consider a change in the number of Participants, updated cost information for the Central Repository provided by the Participants, and modifications to the Plan that include: a requirement that exchanges synchronize their clocks to within 100 microseconds of NIST²⁴⁵²; changes to the Funding Model regarding the manner in which ATs are assessed Central Repository costs; and updated milestones regarding the retirement of duplicative systems. The updated estimates also recognize that the Participants plan to recover some portion of their Plan development costs from industry.

The Commission's revised cost estimates cover 21 Participants, rather than 19 as were covered by the Participants Study. Consequently, the Commission has increased its estimate of the Participants' aggregate implementation costs from \$41.1 million to \$47.7 million, and increased its estimate of the Participants' ongoing annual costs from \$102.4 million to \$118.9 million.²⁴⁵³ Although these changes also increase the Commission's estimate of the implementation and ongoing costs of the Plan to industry, the increases do not change the rounded totals presented in the Notice. The Commission now estimates that the cost of the Plan is approximately \$2.4 billion in initial aggregate implementation costs, \$55 million in system retirement costs, and \$1.7 billion in ongoing annual costs.

²⁴⁵¹ See Section V.C.8, supra and Section VI.F.2.b, infra.

²⁴⁵² See Section V.F.3.a(5), infra.

²⁴⁵³ See Section VI.1.b, infra.

The Commission expands on the analysis of the estimated costs above by exploring individual components of the CAT NMS Plan. In general, the CAT NMS Plan does not break down its cost estimates as a function of particular CAT NMS Plan requirements. Therefore, the Commission discusses the costs of particular requirements separately from the aggregate costs and costs by Participant, and qualitatively discusses costs the Commission is unable to estimate. The Commission has revised its analysis of particular requirements from that in the Notice in three ways. First, the Commission now discusses the uncertainty in its analysis of these costs in more detail. Second, in response to information provided by commenters, the Commission now recognizes that some costs, namely costs associated with reporting Allocation Time and Quote Sent Time, were not included in the estimated costs in the Notice. The Commission now includes these costs in the total costs for broker-dealers where estimates are available or otherwise recognizes them as additional to the existing estimates.²⁴⁵⁴ Third, the Commission no longer judges whether quantified costs attributable to specific elements of the Plan represent a significant contribution to total costs. The Commission is cognizant that some of the costs for particular elements may be significant in isolation even if they are not a large proportion of the aggregate costs of the Plan.

The Commission continues to believe that direct costs in the event of a CAT security breach could be significant, but that certain provisions of Rule 613 and the CAT NMS Plan appear reasonably designed to mitigate the risk of a security breach. Furthermore, the

²⁴⁵⁴ The Commission recognizes that Allocation Time may also increase the costs of the Central Repository and that Quote Sent Time may increase the costs of the Central Repository and to Participants. However, the Commission lacks sufficient information to add these costs to the existing estimates in these categories. Consequently, the Commission discusses the modifications qualitatively.

Commission notes that the Plan amendments and the Participants' response provide more details about the required security provisions and more clarity on the applicability of Regulation SCI standards. The Commission believes that these clarifications address some commenters' concerns by providing more assurances that the security procedures are reasonably designed to prevent security breaches and that customers will be notified in the event of a breach; nevertheless, the Commission acknowledges that the costs of a breach could be quite large.

As discussed further below, the Commission's analysis of the second-order effects that could result from the approval of the Plan is largely unchanged from what was published in the Notice. However, the Commission has revised its analysis to reflect that the Plan will change so that ATS volume is not charged first to broker-dealers operating the ATS and then again to FINRA, which would pass through the fee costs to their members (which include ATSSs). Further, the Commission recognizes certain second-order effects that it did not address in the Notice.

1. Analysis of Expected Costs

The Plan divided the analysis of CAT cost estimates into costs associated with: building and operating the Central Repository; data reporting and surveillance performed by Participants; data reporting by broker-dealers; and CAT implementation costs borne by service providers. The Notice's analysis of the cost estimates of the Plan followed this approach, and the Commission's updated analysis presented here also divides the analysis of costs in this way, incorporating comments, the Participants' responses, and Plan amendments into each analysis.

There were a number of comments on the Commission's cost estimates, which are discussed below in their appropriate subsections. However, one commenter had general comments on uncertainties in cost estimates and the scope of what was covered by cost estimates presented in the Plan, stating, "...the overarching theme throughout the analysis is that these

estimates may not be an accurate reflection of actual costs.”²⁴⁵⁵ The commenter further stated, “the Proposal does not adequately explain what is included in the calculation of “costs” of the system.” The Commission continues to believe that the cost estimates it provided in the Notice were reliable,²⁴⁵⁶ though it acknowledges that uncertainties related to the scope and magnitude of the estimated costs remain.²⁴⁵⁷ The Commission further acknowledges that many cost estimates from the Notice reflect market participants’ estimates of total costs of implementing and maintaining CAT reporting; the Commission agrees with the commenter that the Plan lacks a certain amount of detail on the cost of individual elements that contribute to the total costs of the Plan that will be borne by market participants.

The Commission attempts to address the individual components of the costs separately below in the Further Analysis of Costs Section.²⁴⁵⁸ The Commission has also updated and revised certain cost estimates in response to comments and modifications in the Plan, and explains each of those changes below. The Commission acknowledges that, in light of the predictive nature of the analysis and limitations in the available data, uncertainties remain. The Commission believes, however, that the estimates are reliable in that the methodology used to create the estimates is representative of the costs industry will actually incur, and that the

²⁴⁵⁵ FSR Letter at 9.

²⁴⁵⁶ By characterizing estimates as “reliable,” the Commission is stating its belief that the methodology used to create the estimates is likely to result in estimates that are representative of the costs industry will actually incur, and that the magnitude of the estimates appears to be reasonable. However, the Commission is not suggesting such estimates are free of uncertainty. Indeed, the Commission recognizes a degree of uncertainty – in some cases a large degree – surrounding estimates it is characterizing as “reliable.”

²⁴⁵⁷ See Notice, supra note 5, at 30708.

²⁴⁵⁸ See Section V.F.3, infra for a discussion of some of the individual components of the costs.

magnitude of the estimates appears to be reasonable. The Commission also notes that, while a commenter criticized the uncertainty in the estimates provided in the Notice, the commenter did not offer additional data and did not fault the Commission's analysis of the information it did have.

a. Costs of Building and Operating the Central Repository

In the Notice, the Commission's estimates of costs to build and operate the Central Repository relied on information presented in the Plan as amended on February 27, 2015. At the time of the Notice, the Plan's estimates of the costs to build the Central Repository were based on Bids that varied in a range as high as \$92 million.²⁴⁵⁹ The Plan's estimates of annual operating costs at that same time were based on Bids that varied in a range up to \$135 million. To estimate the one-time total cost to build the Central Repository, the Plan used the Bids of the final six Shortlisted Bidders.²⁴⁶⁰ The eventual magnitude of Central Repository costs is dependent on the Participants' selection of the Plan Processor, and may ultimately differ from estimates discussed in the Plan if Bids are revised as the bidding process progresses. The Plan as filed also provided information based on the Bids on the total five-year operating costs for the Central Repository because the annual costs to operate and maintain the Central Repository are not independent of the build cost. Across the six Shortlisted Bidders, the total five-year costs to build and maintain CAT, according to the Plan at the time of the Notice, ranged from \$159.8 million to \$538.7 million.²⁴⁶¹ In the Notice, the Commission stated its preliminary belief that

²⁴⁵⁹ See Notice, supra note 5, at 30709–11.

²⁴⁶⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B). The Plan does not reflect any more specific cost ranges that result from narrowing the range of Bidders from six to three.

²⁴⁶¹ Id. at Appendix C, Section B.7(b)(i)(B).

estimating Central Repository costs using estimates from the Bids was reliable because they are the result of a competitive bidding process, although the Commission recognized that the Bids are not legally binding on Bidders.²⁴⁶²

As discussed in the Notice,²⁴⁶³ the Commission believed that a range of factors will drive the ultimate costs associated with building and operating the Central Repository and who will bear those costs. Furthermore, the Commission was mindful that the cost estimates associated with building and operating the Central Repository were subject to a number of additional uncertainties. First, the Participants had not yet selected a Plan Processor, and the Shortlisted Bidders had submitted a wide range of cost estimates for building and operating the Central Repository. Second, the individual Bids submitted by the Shortlisted Bidders were not yet final, as Participants could allow Bidders to revise their Bids before the final selection of the Plan Processor. Third, neither the Bidders nor the Commission could anticipate the evolution of technology and market activity with complete prescience.

One commenter provided an alternate estimate for Central Repository ongoing costs.²⁴⁶⁴ The commenter stated, “[w]e estimate the on-going costs for the CAT infrastructure (inclusive of [Business Continuity Plan/Disaster Recovery] costs), to be about \$28 million to \$36 million annually assuming a low-latency platform running at about 50 millisecond speed.” The commenter did not provide additional information or analysis to support this estimate, but the Commission believes it is possible it was derived based on comparisons to costs expected from the Volcker Rule because the commenter cited a study of those costs in support of estimates for

²⁴⁶² See Notice, *supra* note 5, at 30709. The Notice further explains this position.

²⁴⁶³ *Id.* at 30709–30710.

²⁴⁶⁴ Data Boiler Letter at 15.

costs to broker-dealers.²⁴⁶⁵ As discussed below,²⁴⁶⁶ the requirements of the Plan are significantly different than the requirements of the Volcker Rule, which is primarily focused on restricting certain trading activities and investments of banking entities, rather than the centralization and standardization of regulatory data reporting. The Commission also notes that the estimates provided in the Notice and updated in the Participants' response are the result of a competitive bidding process specific to CAT and the Commission deems them reliable.

The Commission is updating and revising its economic analysis to incorporate updated estimates in the Participants' Response Letter III, a modification to the Plan to establish the Company as a 501(c)(6) non-profit entity, and a requirement that the Company's financials be in compliance with GAAP and audited by an independent public accounting firm.²⁴⁶⁷ The Participants' Response Letter III contains estimates of the costs of building and operating the Central Repository from those discussed in the Notice to reflect the fact that Participants have narrowed the number of Bidders to the final three and the range of potential cost estimates is therefore narrower as well. Based on this updated information, the Commission now believes that the costs to build the Central Repository range from \$37.5 million to \$65 million and annual operating costs range from \$36.5 million to \$55 million.²⁴⁶⁸ The Participants also clarified that costs from Bids do not include additional expenses that might be incurred such as insurance, operating reserves or third-party costs such as accounting and legal expenses.²⁴⁶⁹ The

²⁴⁶⁵ Data Boiler Letter at 15.

²⁴⁶⁶ See Section V.F.2.a, infra.

²⁴⁶⁷ See Participants' Letter II.

²⁴⁶⁸ The Commission uses the upper end of cost ranges for its estimates of aggregate costs to industry, as discussed in Section V.F.2.a, infra.

²⁴⁶⁹ Response Letter III at 15.

Commission further acknowledges that these cost estimates for the Central Repository do not include Quote Sent Time reporting by Option Market Makers and the capture of Allocation Time in Allocation Reports.²⁴⁷⁰ The Commission does not have cost estimates of, and lacks sufficient information to estimate, the costs to the Central Repository of these fields and the Plan does not include this information and commenters did not offer estimates. The Commission does not believe these costs will significantly impact the costs of building or operating the Central Repository because the addition of these fields does not significantly impact the size or scope of the Central Repository. Further, the Commission notes that costs from the Company that will be passed on to Industry Members will be slightly reduced by organizing the Company as a non-profit entity because reserve funds will not be taxable as they would have been under the Plan as filed. The Commission notes, however, that CAT fees—the sole revenue source for the Company—are not expected to exceed the Company’s expenses, so the Commission believes these savings will be minor.

Overall, the Commission continues to believe that estimating Central Repository costs using estimates from the Bids is reliable and is therefore updating its cost estimates to reflect updates provided in the Participants’ Response Letter III.²⁴⁷¹

b. Costs to Participants

In the Notice, the Commission stated its preliminary belief that the Plan’s estimates of costs for Participants to report CAT Data and of surveillance costs were reasonable and

²⁴⁷⁰ These fields were included in the Plan, but because the bidding process began before the Exemptive Requests were submitted and approved, it is possible that Bids did not include expenses related to collecting and storing these fields. See Section V.F.3(6), infra and Section V.F.3(4), infra.

²⁴⁷¹ Response Letter III at 15.

explained the reasoning behind this determination.²⁴⁷² At the time, the Plan estimated costs for the Participants as an aggregate across all Participants (the five²⁴⁷³ single-license Participants and the five Affiliated Participant Groups).²⁴⁷⁴ The implementation cost estimate for Participants was \$17.9 million.²⁴⁷⁵ Annual ongoing costs were estimated to be \$14.7 million.²⁴⁷⁶

In the Notice, the Commission estimated that the Participants that filed the Plan currently spend \$6.9 million annually on data reporting, based on estimates the Participants provided in the Plan. The Notice also states that Participants currently spend approximately \$154 million per year on data reporting and surveillance activities. The Participants estimate that they would incur \$41 million in CAT implementation costs, and \$14.7 million in annual ongoing costs to report CAT Data. In addition to data reporting costs, Participants face costs associated with developing and implementing a surveillance system reasonably designed to make use of the information contained in CAT Data as required by Rule 613(f).²⁴⁷⁷ The Notice discussed the Plan's estimates of the costs to Participants to implement surveillance programs using data stored in the Central Repository. The Plan provided an estimate of \$23.2 million to implement

²⁴⁷² See Notice, supra note 5, at 30711.

²⁴⁷³ In its discussion of Participants' costs, the Notice errantly discussed six single license Participants and five Affiliated Participant Groups. See Notice, supra note 5, at 30711. At the time of the notice, there were five single license Participants and six Affiliated Participant Groups. Because Participant costs were aggregated across all Participants in the Plan, this correction does not affect the Commission's estimate of the Participants' costs of the Plan. At this time, there are six single-license Participants and four Affiliated Participant Groups. See infra note V.G.1.a(1)B.

²⁴⁷⁴ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2).

²⁴⁷⁵ Id.

²⁴⁷⁶ Id.

²⁴⁷⁷ 17 CFR 242.613(f).

surveillance systems for CAT, and ongoing annual costs of \$87.7 million.²⁴⁷⁸ At the time, the Plan did not provide information on why Participants' data reporting costs would substantially increase nor did it provide information on why surveillance costs would decrease.

Finally, in the Notice, the Commission assumed that cost estimates presented in the Plan were limited to costs the Participants would incur if the Plan is approved, and that the cost estimates did not include other costs related to development of the Plan that the Participants have incurred previously, or will incur regardless of approval.²⁴⁷⁹ The Plan separately reports that Participants have spent \$8.8 million in development costs to date.²⁴⁸⁰ Because these development costs do not depend on approval of the Plan, the Commission treated them as sunk costs in the Notice and did not include them in the costs to the Participants.²⁴⁸¹

The Commission received several comments regarding the estimates of Participants' data reporting costs in the Notice. One commenter stated that estimates of current data reporting costs to Participants are "grossly underestimated," but did not provide further detail or alternate estimates.²⁴⁸² The same commenter stated the implementation cost estimate of \$17.9 million for Participants was "not too far off," but felt the Participants' estimated costs for legal and

²⁴⁷⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2). Rule 613 requires the SROs to file updated surveillance plans within 14 months of CAT implementation. See 17 CFR 242.613(f). The Commission assumes that the CAT NMS Plan's estimate is limited to adapting current surveillance programs to the Central Repository.

²⁴⁷⁹ The Participants may have incurred obligations that would generate expenses if the Plan were not approved, such as expenses to terminate contracts entered or employees hired in expectation of approval of the Plan. The Commission is not aware of the existence of or details of such obligations.

²⁴⁸⁰ See Notice, supra note 5, at 30711, n.848.

²⁴⁸¹ Id.

²⁴⁸² Data Boiler Letter at 35.

consulting services and additional employees were not reliable. The Commenter stated that these costs could be far lower with different technological approaches to capturing audit trail data.

The Commission also received comments on the estimates of surveillance costs the Participants would incur to incorporate the CAT Data into their surveillance. One commenter implied that savings on surveillance were unlikely, and stated that the lack of an analytical framework did not facilitate the identification of suspicious activities.²⁴⁸³ The commenter seemed to express doubt that CAT would reduce ad hoc data requests, calling this idea “hype.” The commenter further seemed to imply that the comparable magnitude of annual CAT reporting costs and current regulatory data reporting costs raised questions about the reliability of the Commission’s analysis of costs. A second commenter, however, stated that “[t]he consolidated nature of the CAT also should allow the SROs to conduct their market surveillance activities more efficiently, allowing for additional cost savings”²⁴⁸⁴ The commenter did not provide additional detail on what the source of additional efficiencies or cost savings would be. Another commenter noted that uncertainties in the manner in which regulators will access data in the Central Repository create significant cost uncertainties, especially if SROs must use bulk extraction to create copies of CAT Data for analysis within their own infrastructure.²⁴⁸⁵

A few commenters questioned the apparent inclusion or exclusion of certain costs related to the fee model and development costs. One commenter noted that the Participant cost estimates do not include the “per-message toll charge in the CAT funding model.”²⁴⁸⁶ The

²⁴⁸³ Data Boiler Letter at 35.

²⁴⁸⁴ SIFMA Letter at 18.

²⁴⁸⁵ SIFMA Letter at 33.

²⁴⁸⁶ Data Boiler Letter at 35.

Commission received several comments on the \$8.8 million Participants incurred in developing the Plan. One Commenter stated that treating all costs related to the development of the Plan as sunk costs “...may sound conservative”, and is a preferred approach if a broad alternative to the Plan is adopted instead of the Plan as noticed.²⁴⁸⁷

The Participants restated their intention to recoup implementation costs in Participants’ Response Letter II.²⁴⁸⁸ Furthermore, they cited an expectation of \$10.6 million in savings from retiring existing systems. The Participants further stated that these savings would offset costs of implementing CAT.

The Commission considered the comments, the Participants’ responses, and modifications to the Plan and, as explained below, is updating its analysis of Participants’ CAT costs. These changes acknowledge a change in the number of Participants, the addition of Quote Sent Times for option market maker quotes, requirements to produce additional reports and add more specificity in current reports, as well as producing current reports more frequently, the requirement to conduct an independent audit of expenses for the development of the Plan, annual audit expense for the Company, and a modification to the clock synchronization requirement for exchanges. The Commission is also acknowledging system retirement costs that the Participants will incur when duplicative reporting systems are retired. Further, in response to a comment and the Participants’ response, the Commission is also revising its cost estimates to change how it treats the costs already incurred by Participants to develop the Plan.

The Commission has considered the comments it received regarding cost estimates for Participants in the Plan and continues to believe that Participant cost estimates presented in the

²⁴⁸⁷ See Notice, supra note 5, at 30737; see also Data Boiler Letter at 37.

²⁴⁸⁸ Response Letter II at 13.

Plan are reliable. As discussed in the Notice, all 19 SROs²⁴⁸⁹ responded to the Participants Study, and most SROs have experience collecting audit trail data, familiarity with the requirements of CAT, and expertise in their business practices. The commenter that challenged the current data reporting costs provided no reasoning or estimates to indicate that the Participants are unable to reasonably estimate their own costs. Regarding the comment that its estimates did not fully incorporate the “per-message” fees that Participants will face, the Commission notes that the Plan’s funding model does not charge Participants for message-traffic. Further, the Commission’s analysis acknowledged that Central Repository costs will be passed on to both Participants and Industry Members by an unidentified formula, thus it accounted for funding model costs separately in its analysis of total costs of the Plan.

Regarding the comment concerning the inclusion of an analytical framework in surveillance cost estimates in the Plan, the Plan does incorporate an analytical framework.²⁴⁹⁰ Therefore, the Commission believes that Participant cost estimates already account for an analytical framework. Regarding the uncertainties in Participant costs related to bulk extraction causing SROs to host their own copies of CAT Data, while the Plan requires a bulk extraction tool, it also requires analytical tools for manipulating and analyzing data within the Central Repository.²⁴⁹¹ The Commission believes that the requirement for a method of bulk downloading data does not necessarily imply that multiple copies of CAT Data will be hosted on SRO systems. The Commission acknowledges that if SROs use the bulk download feature to replicate some or all CAT Data on their own systems, their costs are likely to increase because

²⁴⁸⁹ There were 19 participants at the time the Participants conducted the study.

²⁴⁹⁰ See Section V.E.2.c.(1), *supra*.

²⁴⁹¹ See Notice, *supra* note 5, at Appendix D, Section 8.2.

hosting large databases is costly. However, the Commission believes that SROs are likely to consider the cost implications when contemplating replicating large portions of the Central Repository within their IT infrastructure and presumably will only do so when it is efficient for them to do so.

The Commission recognizes, however, that the Plan calls for recovery of some or all of the CAT development costs from Industry Members. And, based on the Participants' response, the Commission now believes that the expectation the Participants will recoup these costs will effectively reduce the SROs' future costs while increasing future costs of Industry Members. The Commission therefore is adding the development costs for CAT to the implementation costs of broker-dealers, as indicated in the following Section, and subtracting them from Participants' implementation costs as in Table 3 below. Overall, as detailed in the Aggregate Costs Section below, the Commission also believes the recovery of these costs from Industry Members would constitute a transfer from Industry Members to Participants, but would not affect the total cost of CAT to market participants in aggregate.

The Commission is revising its Participant cost estimates to account for additional requirements that result from modifications made to the Plan by the Commission. These requirements include a number of reports, some produced one time, some produced on an ongoing basis. Each of these requirements is discussed briefly below. In aggregate, the Commission estimates they have a one-time cost of \$1.1 million and annual, ongoing costs of \$1.1 million.

First, the Plan as amended requires a written assessment of the operation of the CAT on an annual, rather than biannual basis, and requires the assessment to provide more specificity.²⁴⁹²

The Commission estimates the production of this report will cost \$870,000 annually.²⁴⁹³

Second, the Plan now requires an independent audit of expenses incurred prior to the Effective Date. The Commission believes that this one-time audit will cost approximately \$5,000.²⁴⁹⁴

Third, the Plan now requires a review of clock synchronization standards, including consideration of industry standards based on the type of CAT Reporter, Industry Member and

²⁴⁹² The assessment is now required to include the following: (1) an evaluation of the information security program of the CAT to ensure that the program is consistent with the highest industry standards for protection of data; (2) an evaluation of potential technological upgrades based upon a review of technological developments over the preceding year, drawing on necessary technological expertise, whether internal or external; (3) an assessment of efforts to reduce the time to restore and recover CAT Data at a back-up site; (4) an assessment of how the Plan Processor and SROs are monitoring Error Rates and address the application of Error Rates based on product, data element or other criteria; and (5) a copy of the evaluation required by Section 6.8(c) as to whether industry standards have evolved such that: (i) the clock synchronization standard in Section 6.8(a) should be shortened; or (ii) the required timestamp in Section 6.8(b) should be in finer increments; and (6) an assessment of whether any data elements should be added, deleted or changed. See Section IV.H., supra. Although the bi-annual assessment was required under the Plan and its costs would thus have been included in the Participants' cost estimates presented in the Plan, the requirements have changed such that the report is both produced more frequently and is presented in greater detail. Consequently, the Commission assumes that the majority of the cost of this report would not be covered by cost estimates presented in the Plan as filed, and is adding the cost of this reporting to its final cost estimates. To the extent that a less detailed bi-annual report was already included in the Participants' cost estimates, the revised cost estimate overestimates this reporting cost.

²⁴⁹³ Detailed cost estimates are discussed in Section VI.D.1.f.B, infra.

²⁴⁹⁴ To arrive at this estimate, the Commission relied on an industry source for the costs of an audit per dollar of revenue, and assumed that the audit cost per unit of revenue would be comparable to the audit cost per unit of development costs, which were approximately \$8.8 million. See infra note 2503. $\$8.8 \times \$479 = \$4,215 \sim \$5,000$.

type of system within six months of the Effective Date. The Commission estimates that the production of this study will have a one-time cost of approximately \$133,000.²⁴⁹⁵

Fourth, the Plan now requires the Participants to submit a report detailing the Participants' consideration of coordinated surveillance (e.g., entering into Rule 17d-2 agreements or regulatory services agreements), within 12 months of effectiveness of the Plan. The Commission estimates this report will entail a one-time cost of \$445,000.²⁴⁹⁶

The Plan now also requires the Participants to provide a report discussing the feasibility, benefits, and risks of allowing an Industry Member to bulk download the Raw Data it submitted to the Central Repository, within 24 months of effectiveness of the Plan. The Commission estimates this requirement will entail a total one-time cost of approximately \$147,000.²⁴⁹⁷

The Plan now also requires the Participants to submit an assessment of errors in the customer information submitted to the Central Repository that considers whether to prioritize the correction of certain data fields over others, within 36 months of effectiveness of the Plan. The Commission estimates this requirement will entail an approximate one-time cost of \$186,000.²⁴⁹⁸

The Plan now requires the Participants to submit a report to study the impact of tiered-fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity, within 36 months of effectiveness of the Plan. The

²⁴⁹⁵ See Section VI.G.1.b, infra.

²⁴⁹⁶ See Section VI.G.1.c, infra. The Commission assumes an hourly labor rate of \$235.75 that is based on the FTE annual cost provided by the Participants in the Plan and an assumption of 1,800 hours annually. See Notice, supra note 5 at 30762 n.1243. \$424,350 / 1800 hours = \$235.75.

²⁴⁹⁷ See Section VI.G.1.d, infra.

²⁴⁹⁸ See Section VI.G.1.e, infra.

Commission estimates this requirement will have a one-time external cost of \$110,000.²⁴⁹⁹

The Plan now requires an assessment of the impact on the maximum Error Rate in connection with any Material Systems Change to the CAT; the Commission assumes that the CAT may have four Material Systems Changes per year. The Commission estimates this requirement will entail an ongoing annual cost of \$138,000.²⁵⁰⁰

The Plan now requires that the Advisory Committee members receive the same materials as the Operating Committee absent confidentiality concerns with respect to such information. The Commission estimates this will require an aggregate annual cost of \$2,400.²⁵⁰¹

The Plan now requires that the CAT LLC financials (i) be in compliance with GAAP, (ii) be audited by an independent public accounting firm, and (iii) be made publicly available.²⁵⁰²

The Commission estimates these requirements to entail costs of \$65,000 annually.²⁵⁰³

²⁴⁹⁹ See Section VI.G.1.f, *infra*. The Commission assumes an hourly labor rate of \$235.75 that is based on the FTE annual cost provided by the Participants in the Plan and an assumption of 1,800 hours annually. See Notice, *supra* note 5 at 30762 n.1243. $\$424,350 / 1800 \text{ hours} = \235.75 .

²⁵⁰⁰ See Section VI.G.1.g, *infra*.

²⁵⁰¹ See Section VI.G.1.h, *infra*.

²⁵⁰² See Section IV.B.4, *supra*; see also Participants' Letter II.

²⁵⁰³ To estimate this number, the Commission drew from a recent Commission adopting release and an industry report. Specifically, the Commission's Crowdfunding Adopting Release estimated that the audit costs for affected issuers would be \$2,500 to \$30,000. See Securities Act Release No. 9974 (October 30, 2015), 80 FR 71499 (November 16, 2015). The Commission believes this estimate could be reasonable if the Company's financials are of the same level of complexity as the larger issuers affected by the Crowdfunding rule, which is realistic because the Company is not publicly traded, is organized as a "business league", and has a limited and predictable revenue stream. As an alternative estimate, the Commission estimated an audit cost of approximately \$65,000 using an industry estimate of \$479 in audit costs per \$1 million in revenue, using the assumption that Company revenue will just offset expected costs of \$139 million. See Audit Analytics report "Audit Fees and Non-Audit Fees: A Twelve Year Trend," October 9, 2014, available at <http://www.auditanalytics.com/blog/audit-fees-and-non->

Finally, the Plan now requires that each Participant conduct background checks of its employees and contractors that will use the CAT System. The Commission estimates that this requirement would entail an initial cost of \$60,000, with ongoing annual costs of \$14,000.²⁵⁰⁴

The Commission is also revising its Participant cost estimates to account for the addition of two additional Participants that were not covered by the Participants Study.²⁵⁰⁵ The Commission assumes the new Participants will have similar costs to the 19 Participants that provided cost estimates summarized in the Plan. Consequently, the Commission has increased its estimates of Participants costs by 10.53%.²⁵⁰⁶ The Commission now estimates that the 21 Participants spend \$8 million annually for data reporting, and \$162.7 million for surveillance. The Commission estimates that implementation of CAT Data reporting will cost the Participants \$19.8 million, and implementation of surveillance using data in the Central Repository will cost the Participants \$25.6 million. The Commission estimates that Participants will spend \$16.2 million annually to maintain CAT Data reporting, and \$96.9 million annually on surveillance. The Commission is also recognizing that the Participants will recoup \$8.8 million in Plan development costs, as discussed above. The Commission estimates that Participants will spend approximately \$1.1 million to produce one-time reports required by amendments to the Plan, and

audit-fees-a-twelve-year-trend/. $\$479 \times \$139 = \$64,665 \sim \$65,000$. The Commission incorporates the higher estimate from the two methodologies (\$65,000) into its cost estimates.

²⁵⁰⁴ See Section VI.G.1.i, *infra*.

²⁵⁰⁵ The Participants Study covered the 19 Participants that were operating as Participants at the time the study was conducted. The Notice acknowledged that ISE Mercury would likely become a Participant before the Plan was implemented, but cost estimates presented in the Notice did not account for costs that ISE Mercury would incur due to the Plan. Since filing the Plan, ISE Mercury and IEX have become Participants in the Plan.

²⁵⁰⁶ $100 \times (2/19) = 10.53\%$.

\$1.1 million annually to produce additional periodic reports required by amendments to the Plan. Furthermore, the Commission is recognizing \$343,000 in system retirement costs, as discussed below.²⁵⁰⁷ The Commission is unable to update cost estimates to account for the modifications to the clock synchronization standards for exchanges, but, as discussed below, the Commission does not believe that the modifications will result in substantial cost increases for exchanges.²⁵⁰⁸ The Commission acknowledges that the addition of quote sent times to option market maker quotes may increase costs to options exchanges. Based on comments received, the Commission believes that Participant cost estimates from the Participants Study are unlikely to include the additional expense Participants will incur capturing and processing the Quote Sent Time field. The Commission lacks information to estimate these costs for Participants because the Plan does not include this information and commenters did not offer estimates. Table 3 reflects the Commission's estimates after taking these adjustments into consideration.

²⁵⁰⁷ See Section V.F.2.b, infra.

²⁵⁰⁸ See Section V.F.3.a(5), infra.

Table 3: Estimates of Participants' Costs

	Current	CAT Implementation	System Retirement	CAT On- Going
Data Reporting	\$7,626,570	\$19,784,870		\$16,247,910
Surveillance	\$162,700,160	\$25,642,960		\$96,934,810
Development Recoup		(\$8,800,000)		
Additional Reporting Requirements		\$1,085,927		\$1,089,137
Total	\$170,326,730	\$37,713,757	\$342,632	\$114,271,857

c. Costs to Broker-Dealers

(1) Summary of Notice and Comments and
Commission's Response

In the Notice, the Commission provided an analysis of the compliance cost estimates for broker-dealers that included analyzing whether estimates provided in the Plan and based on a Reporters Study survey were reliable.²⁵⁰⁹ The Commission preliminarily believed that the cost estimates for small broker-dealers were not reliable. The Commission described the details of the analysis supporting that conclusion. The Commission then developed and calibrated a model (“Outsourcing Cost Model”) to estimate average current data reporting costs and average Plan compliance costs for broker-dealers that the Commission expects will rely on service bureaus to perform their CAT Data reporting responsibilities (“Outsourcers”). For other broker-dealers, the “Insourcers,” the Commission continued to rely on the large broker-dealer estimates from the Plan. Using this framework, the Commission estimated approximate one-time implementation costs for broker-dealers of \$2.1 billion, and annual ongoing costs of CAT reporting of \$1.5 billion.

²⁵⁰⁹ See Notice, supra note 5, at 30712–26.

The Commission received comments on the reliability of its Outsourcing Cost Model and its re-estimation of costs. One commenter stated that the Commission’s estimates of service bureau charges for a small firm “sound reasonable.”²⁵¹⁰ Another commenter noted that even when Outsourcers rely on their service providers (service bureaus or clearing firms) to accomplish current data reporting, the Outsourcers must expend internal resources as well.²⁵¹¹ A third commenter stated that broker-dealers that clear for other broker-dealers may face higher implementation costs because they may support more broker-dealers than they did before implementation of the Plan.²⁵¹² This commenter also stated that the Commission has not analyzed the cost implications of the phased implementation of small and large Industry Members.²⁵¹³ The Commission did not receive comments on its analysis or conclusion that the Reporters Study did not provide reliable cost estimates for small broker-dealers.

The Commission also received several comments on uncertainties in broker-dealer cost estimates. Three of these comments related to the selection of the Plan Processor. One commenter stated, “not knowing who the CAT Processor is introduces a significant amount of uncertainty. . . . We believe the Commission discounts the importance of the choice of Plan Processor as it relates to implementation costs. While the bids to build the Processor may be within a sufficiently narrow range so as to negate those costs, the choice of Processor may have a

²⁵¹⁰ Data Boiler Letter at 36.

²⁵¹¹ Specifically, this commenter references EBS reporting, but indicates that broker-dealers sometimes must also be involved in preparing EBS request responses. See FIF Letter at 34.

²⁵¹² TR Letter at 3–4.

²⁵¹³ TR Letter at 3.

significant impact on broker-dealer implementation costs.”²⁵¹⁴ A commenter stated that the differences in Bids prevented broker-dealers from “...provid[ing] more definitive cost estimates and other projections related to CAT implementation.”²⁵¹⁵ Other commenters noted that the Plan’s lack of specific details creates uncertainty around what costs broker-dealers will incur to implement these provisions.²⁵¹⁶ Other comment letters discussed the general uncertainties that result from not having the technical specifications.²⁵¹⁷

The Commission has considered these comments, the Participants’ response, and modifications to the Plan and is updating and revising its cost estimates. As discussed below, the Commission now acknowledges that its estimates exclude some additional costs that would be faced by Outsourcers or new reporters that clear for other broker-dealers, or that provide support for introducing broker-dealers. The Commission further acknowledges that broker-dealer costs presented in its analysis are subject to significant uncertainties and recognizes additional sources of uncertainty. The Commission is also updating its analysis of the costs to recognize the effects of modifications to the requirement to report an open/close indicator and allocation time, and is revising its analysis to indirectly account for the Participants’ development costs. However, the Commission is not revising the structure of its Outsourcing Cost Model, its conclusions regarding the reliability of the Reporters Study, or estimates of the broker-dealers’ current, implementation or ongoing costs.

²⁵¹⁴ TR Letter at 4; FSI Letter at 6.

²⁵¹⁵ FSI Letter at 6.

²⁵¹⁶ SIFMA Letter at 42; FSI Letter at 6.

²⁵¹⁷ See, e.g., FSR Letter at 10; SIFMA Letter at 23; UnaVista Letter at 2; Fidelity Letter at 6.

With respect to the comment that the Outsourcing Cost Model does not account for internal expenses that support outsourced activities, the Commission notes that its cost estimates explicitly assume that Outsourcers have employee expenses that cover these activities.²⁵¹⁸ With respect to the commenters concerned that the Commission's estimates do not account for an increase in costs for broker-dealers that clear for other broker-dealers or provide support to introducing broker-dealers, the Commission continues to believe the analysis of broker-dealer implementation costs presented in the Notice is generally reliable, and notes that Reporters Study estimates for large broker-dealers are likely to include these expenses because survey respondents are likely to include broker-dealers that provide these services. The Commission acknowledges, however, that there are some broker-dealers – such as one of the commenters – that would be classified as Outsourcers or new reporters for which the Commission's cost estimates rely on the Outsourcing Cost Model, and the additional implementation costs that these firms face due to clearing for other broker-dealers or supporting introducing broker-dealers are not captured by the Outsourcing Cost Model. Costs that Outsourcers and new reporters that continue to clear for other broker-dealers will face include, but are likely not limited to, additional costs associated with reporting customer information to the Central Repository and costs associated with receiving customer information from their broker-dealer clients. Outsourcers and new reporters that currently clear for other broker-dealers or support introducing broker-dealers that elect to outsource their clearing or regulatory data reporting will face costs that include, but are not limited to, costs associated with establishing service provider relationships with other broker-dealers; and lost revenues from providing services for other firms

²⁵¹⁸ See Notice, supra note 5, at 30723.

if those firms cease providing clearing services or supporting introducing broker-dealers, although the Commission believes that they might be able to establish “piggyback” arrangements that allow them to retain their relationships with current customers.²⁵¹⁹ The Commission, however, cannot estimate the number of broker-dealers that would bear these costs because the Commission lacks data on the number of broker-dealers that clear for other broker-dealers that would be classified as new reporters or Outsourcers. Furthermore, the Commission lacks data to estimate the magnitude of these costs because the Plan does not provide this data and the Commission is unaware of any data available to it that it could use to estimate these costs.

In response to comment letters that identified sources of uncertainties related to the costs Industry Members will incur, the Commission acknowledges that such costs depend on the Technical Specifications, which will be published no later than one year before Industry Member reporting begins. The Commission now believes that the sources of uncertainty include both how Technical Specifications would vary across Bids, and what costs of CAT are included in cost estimates obtained from market participants and presented in the Plan and included in the Commission’s analysis.²⁵²⁰ However, the Commission notes that final Bids will not be submitted until after the Plan is approved, so the Commission is unable to quantify the degree of variation in broker-dealer implementation costs across Bids.

²⁵¹⁹ Costs related to outsourcing services such as clearing are discussed in Section V.F.1.c, supra, and Section V.G.1.d, infra. “Piggyback” relationships are discussed in the Notice, supra note 5, at 30716 n.894.

²⁵²⁰ For example, the analyses in the Plan and the Commission’s analysis assume that respondents to cost surveys are representative of their respective groups. If broker-dealers that clear for other broker-dealers or serve as introducing broker-dealers did not respond to cost surveys, the costs such broker-dealers are likely to face might not be represented by Plan estimates, and the Commission’s estimates where they rely on the Plan’s estimates.

The Commission has also revised its analysis of its cost estimates to account for the following things: the clarification that Participants intend to recoup their development costs; modifications to the Plan regarding reporting the open/close indicator for equities and Options Market Makers; costs for Options Market Makers to provide Quote Sent Time; and costs related to providing allocation times on Allocation Reports. The Participants' response clarified that the Participants intend to recoup some of the more than \$8.8 million they have already spent to develop the CAT NMS Plan by collecting fees from broker-dealers.²⁵²¹ In the Notice, the Commission treated such costs as sunk costs incurred by the Participants and did not include them in its analysis of the Plan, but is now recognizing that these costs will be transferred to broker-dealers.²⁵²² Therefore, the Commission adds the development costs to the costs to broker-dealers.²⁵²³ The Commission recognizes that the modification that removes the open/close indicator for equities and Options Market Makers will reduce the implementation and potentially ongoing costs for Industry Members. However, as discussed in the further analysis of costs Section below,²⁵²⁴ the Commission is not certain whether Industry Members included these

²⁵²¹ See Section V.F.1.b, supra, for further discussion.

²⁵²² See Notice, supra note 5, at n 848. This clarification to the Plan, and comments received on this clarification, which are discussed in Section IV, imply disagreement with the Commission's treatment of these costs as sunk costs in the Notice. The Commission notes that these costs have already been incurred, so are not attributable to the Approval of the Plan, but rather are costs associated with and anticipated by Rule 613. Furthermore, the recovery of these costs by the Participants does not change the cost to industry of the Plan; rather the costs comprise a transfer from one market participant type (Industry Members) to another (Participants). Consequently, the cost of the Plan to industry is unaffected. The Commission acknowledges that this transfer will increase broker-dealer costs and decrease Participant costs.

²⁵²³ This cost is also subtracted from costs to Participants. See Section V.F.1.b, supra.

²⁵²⁴ See Section V.F.3.a(2), infra, for a more detailed discussion of the effect of this modification.

costs in their cost survey results, and the Commission does not have sufficient information on these costs to remove them from its estimates.²⁵²⁵ With regard to Quote Sent Time, the Commission is incorporating estimates discussed in the Notice but not included separately in cost estimates published in the Notice.²⁵²⁶ The Commission recognizes that the modifications related to including allocation times will reduce costs to Industry Members, but also recognizes that the Commission did not previously account for these costs in estimates of their costs.²⁵²⁷ Therefore, the Commission is adding the estimated costs of including allocation time as required under the Plan as amended to its cost estimates. The Commission notes that this increase in broker-dealer costs is small relative to the other estimated costs of broker-dealers and therefore does not change the rounded estimates.

Therefore, in its final analysis, the Commission estimates approximate one-time implementation costs for broker-dealers of \$2.2 billion, and annual ongoing costs of CAT reporting of \$1.5 billion.

²⁵²⁵ The Commission believes the estimates are conservative in this dimension as they overestimate broker-dealer implementation costs due to the removal of the open/close indicator from the material terms of the order insofar as broker-dealers included that indicator in their implementation cost estimates in the Reporters Study survey.

²⁵²⁶ The Notice discusses estimates of five year implementation and ongoing costs of up to \$76.8 million. The Commission notes that for other broker-dealer costs, implementation costs are 146.46% of ongoing costs and assumes that ratio of implementation to ongoing costs for Quote Sent Time. (1.4646 ongoing costs + 5 x ongoing costs = \$76.8 million.) See Section V.F.3.a(6), infra for discussion of these estimates and their treatment in the Notice and this Order.

²⁵²⁷ See Section V.F.3.a(4), infra, for a more detailed discussion of the costs of including allocation times on Allocation Reports.

(2) Commission’s Final Analysis

The discussion that follows provides a synopsis of the Commission’s final analysis of the compliance costs of broker-dealers. Because the Commission is not revising the structure of its Outsourcing Cost Model or its conclusions regarding the reliability of the Costs to CAT Reporters Study (“Reporters Study”)²⁵²⁸, the final analysis regarding these below provides a summary of the more detailed discussions in the Notice.

A. Estimates in the Plan

The Plan, as amended on February 27, 2015, estimates total costs for those broker-dealers expected to report to CAT. In particular, the Plan relies on the Reporters Study. Based on the Reporters Study survey data, the Plan estimates implementation costs of less than \$740 million for small firms²⁵²⁹ and approximately \$2.6 billion for large firms, for a total of \$3.34 billion in implementation costs for broker-dealers.²⁵³⁰ For annual ongoing costs, the Plan estimates costs of \$739 million for small firms and \$2.3 billion for large firms, for a total of \$3.04 billion in annual ongoing costs for broker-dealers.²⁵³¹

The Commission believes, however, that the cost estimates for small broker-dealers provided in the Plan, which are based upon responses set forth in the Reporters Study, do not

²⁵²⁸ See Notice, supra note 5, at 30712–14.

²⁵²⁹ Survey respondents were instructed to classify themselves as “small” if their Total Capital (defined as net worth plus subordinated liabilities) was less than \$500,000. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C) n.188. This is consistent with the definition of “small business” or “small organization” used with reference to a broker or dealer for purposes of Commission rulemaking in accordance with provisions of Chapter Six of the Administrative Procedure Act (5 U.S.C. 601 et seq.). See 17 CFR 240.0-10(c).

²⁵³⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iv)(A)(3).

²⁵³¹ Id.

provide reliable estimates of smaller CAT Reporter costs for a number of reasons discussed in detail in the Notice and summarized herein.²⁵³² First, some respondents classified as small in the Reporters Study appear to have responded numerically with incorrect units, with such responses resulting in annual estimated cost figures that would be 1,000 times too large. Second, maximum responses in certain categories of costs suggest that some large broker-dealers may have misclassified themselves as small broker-dealers.²⁵³³ Third, methods used to remove outliers are likely to have introduced significant biases. Finally, the response rate to the Reporters Study survey was low and is likely to have oversampled small broker-dealers who currently have no OATS reporting obligations.²⁵³⁴

Although the Commission concludes that the small broker-dealer cost estimates presented in the Plan are unreliable, the Commission also believes, for reasons discussed in detail in the Notice and summarized herein, that the cost estimates in the Plan for large broker-dealers are reliable.²⁵³⁵ The Plan estimates that an OATS-reporting large broker-dealer has current data

²⁵³² See Notice, supra note 5, at 30712–14.

²⁵³³ The Plan presents summary statistics such as average, median and maximum for each survey response. See CAT NMS Plan, supra note 5, at Appendix C, Section B(7)(b)(ii)(C), Table 5. In the left most column, \$14 million is the maximum response for “Hardware/Software Current Cost.”

²⁵³⁴ In reaching these conclusions, the Commission reviewed the detailed discussions of the Reporters Study survey methodology in the Plan and the survey form and instructions provided to respondents. See 6/23/14 entry on CAT NMS Plan website, available at <http://www.catnmsplan.com/pastevents/index.html>. The Commission Staff also discussed with the Participants potential methodology adjustments in aggregating the CAT Reporters Study data. After Commission Staff discussions with the Participants, the Commission concluded that no methodology could address these fundamental issues with the survey data.

²⁵³⁵ See Notice, supra note 5, at 30714.

reporting costs of \$8.7 million per year.²⁵³⁶ A non-OATS reporting large broker-dealer is currently estimated to spend approximately \$1.4 million annually.²⁵³⁷ The Plan estimates that OATS-reporting large broker-dealers would spend approximately \$7.2 million to implement CAT Data reporting, and \$4.8 million annually for ongoing costs.²⁵³⁸ For non-OATS reporting large broker-dealers, the Plan estimates \$3.9 million in implementation costs and \$3.2 million in annual ongoing costs.²⁵³⁹

B. Commission Cost Estimates

As discussed in detail in the Notice, the Commission believes that the small firm cost estimates presented in the Reporters Study are unreliable. Therefore, the Commission has re-estimated the costs that broker-dealers likely would incur for CAT implementation and ongoing reporting.²⁵⁴⁰ The Commission's broker-dealer cost estimates incorporate some broker-dealer data from the Plan, but to address issues in the Plan's Reporters Study data, the Commission's

²⁵³⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.(7)(b)(ii)(C), Table 3. The \$8.7 million figure was calculated by summing the average hardware/software cost, third party/outsourcing cost, and full-time employee costs using the Commission's estimated cost per employee of \$424,350.

²⁵³⁷ Id. at Appendix C, Section B.(7)(b)(ii)(C), Table 4. The \$1.4 million figure was calculated by summing the average hardware/software cost, third party/outsourcing cost, and full-time employee costs using the Commission's estimated cost per employee of \$424,350.

²⁵³⁸ Id. at Appendix C, Section B.(7)(b)(iii)(C)(2)a., Table 9; Appendix C, Section B.(7)(b)(iii)(C)(2)b., Table 15.

²⁵³⁹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.(7)(b)(iii)(C)(2)a., Table 10; and at Appendix C, Section B.(7)(b)(iii)(C)(2)b., Table 16.

²⁵⁴⁰ See Notice, supra note 5, at 30717–24.

cost estimates also include other data sources described in the Notice.²⁵⁴¹ As with the Plan’s cost estimates, the Commission’s re-estimation relies on classifying broker-dealers based on whether they currently report OATS data. However, the re-estimation further classifies broker-dealers based on whether the firm is likely to use a service bureau to report its regulatory data, or, alternatively, whether the firm may choose to self-report its regulatory data. In this re-estimation, the Commission estimates that the 1,800 broker-dealers expected to incur CAT reporting obligations spend approximately \$1.6 billion annually to report regulatory data.²⁵⁴² The Commission believes that these broker-dealers will incur approximately \$2.2 billion in implementation costs and \$1.5 billion in ongoing data reporting costs.²⁵⁴³ As explained in more detail in the Notice, the Commission believes classifying broker-dealers based on their manner of reporting provides a more accurate estimate of the costs firms will incur because costs differ based on whether the firm insources or outsources reporting responsibilities and insourcing/outsourcing does not necessarily correlate with firm size.²⁵⁴⁴ The Commission maintains the Plan’s approach of separating broker-dealer costs of OATS reporting firms from those that have no OATS reporting obligations, recognizing that the group of non-OATS reporting firms are diverse in size and scope of activities. As discussed in detail in the Notice, the Commission believes this is appropriate because firms that do not currently report to OATS

²⁵⁴¹ Discussions below present information included in the Notice on data obtained from FINRA and gleaned from discussions with broker-dealers and service bureaus arranged by FIF and staff. *Id.* at 30715.

²⁵⁴² To the extent that the CAT NMS Plan underestimates the number of broker-dealers that would incur CAT reporting obligations, the Commission’s estimates presented in the Notice understate the actual costs Reporters will face.

²⁵⁴³ These figures cover only broker-dealer costs. Industry-wide costs are summarized below.

²⁵⁴⁴ See Notice, supra note 5, at 30715–17.

will face a different range of costs to implement and maintain CAT reporting because firms that do not report to OATS are likely to have little to no regulatory data infrastructure in place.

The Commission's framework for estimation of broker-dealers costs, as presented in the Notice and adopted here without alteration, is based on analysis of data provided by FINRA and discussions with broker-dealers and service providers that were detailed in the Notice.²⁵⁴⁵

Analysis of data reported by FINRA confirms that there are two primary methods by which broker-dealers accomplish data reporting: insourcing, where the firm reports data to regulators directly; and outsourcing, where a third-party service provider performs the data reporting, usually as part of a service agreement that includes other services. Based on data from FINRA and conversations with market participants discussed in the Notice, the Commission believes that the vast majority of broker-dealers outsource most of their regulatory data reporting functions to third-party firms. A broker-dealer's decision to insource/outsource these functions and services can be complex, and different broker-dealers reach different solutions based on their business characteristics. To illustrate, some broker-dealers self-clear trades but outsource regulatory data reporting functions; some broker-dealers have proprietary order handling systems, self-clear trades, and outsource regulatory data reporting functions. Other broker-dealers outsource order-handling, outsource clearing trades, and self-report regulatory data. The most common insource/outsource service configuration, however, for all but the most active-in-the-market broker-dealers is to use one or more service bureaus to handle all of these functions.

²⁵⁴⁵ Id. at 30714 n.880.

The framework for the Commission’s re-estimation, which is described in more detail in the Notice, is as follows.²⁵⁴⁶ First, the Commission identifies those OATS-reporting firms that insource (“Insourcers”) and those that outsource based on an analysis of the number of OATS Reportable Order Events (“ROEs”) combined with specific data provided by FINRA on how firms report OATS data. Furthermore, the Commission separately identifies firms that do not report to OATS but are likely to insource based on their expected activity level by identifying Options Market Makers and Electronic Liquidity Providers (“ELPs”). Based on that analysis, the Commission estimates that there are 126 OATS-reporting Insourcers and 45 non-OATS reporting Insourcers.²⁵⁴⁷ The Commission’s re-estimation classifies the remaining 1,629 broker-dealers that the Plan anticipates will have CAT Data reporting obligations as “Outsourcers,” based on outsourcing practices observed in data obtained from FINRA.²⁵⁴⁸ Next, to determine costs for Insourcers, the Commission relies upon cost estimates for firms classified as “large” in the Reporters Study.

For Outsourcers, the Commission uses a model of ongoing outsourcing costs (“Outsourcing Cost Model”) to estimate both current regulatory data reporting costs and CAT-related data reporting costs Outsourcers will incur if the CAT NMS Plan is approved. The Commission analyzed data provided by FINRA to establish a count of CAT Reporters likely to outsource their regulatory data reporting functions. The Commission’s analysis of FINRA reporting data, which is discussed in the Notice, allowed the Commission to examine how broker-dealers’ current outsourcing activities varied with the number of ROEs reported to

²⁵⁴⁶ Id. at 30715.

²⁵⁴⁷ Id.

²⁵⁴⁸ Id. at 30715–16.

OATS. Based on this analysis, the Commission believes that the 126 broker-dealers that reported more than 350,000 OATS ROEs between June 15 and July 10, 2015 made the insourcing-outsourcing decision strategically based on the broker-dealer's characteristics and preferences, while the remaining OATS reporters were likely to utilize a service bureau to accomplish their regulatory data reporting.²⁵⁴⁹

The Commission estimates ongoing costs for outsourcing firms using a model which, as discussed in more detail in the Notice, was based on data gleaned from discussions with service bureaus and broker-dealers and implementation costs using information learned in conversations with industry.²⁵⁵⁰ Based on discussions with market participants, the Commission assumes that the cost function for outsourcing is concave²⁵⁵¹ and applies the same assumption to its final analysis. This type of function is appropriate when costs increase as activity level increases, but the cost per unit of activity (e.g., cost per report) declines as activity increases. For reasons indicated in the Notice, the Commission relies on a schedule of average charges to access liquidity and rebates to provide liquidity from four non-inverted exchanges to estimate the concavity of the exchange pricing function, which the Commission uses to approximate the

²⁵⁴⁹ The Commission believes this decision is strategic and discretionary because FINRA data reveals that while many broker-dealers at these activity levels self-report most or all of their regulatory data, other broker-dealers outsource most or all of their regulatory reporting at these activity levels. At lower activity levels, most, but not all, broker-dealers outsource most if not all of their regulatory data reporting. The Commission is cognizant that some broker-dealers reporting fewer than 350,000 OATS ROEs per month can and do opt to self-report their regulatory data. However, based on conversations with broker-dealers, the Commission believes that most broker-dealers at these activity levels do not have the infrastructure and specialized staff that would be required to report directly to the Central Repository, and electing to self-report would be cost-prohibitive in most but not all cases.

²⁵⁵⁰ See Notice, supra note 5, at 30718–24, for more information on these discussions.

²⁵⁵¹ Id. at 30719, for more information on these discussions.

concavity of the outsourcing cost model.²⁵⁵² The model's output, which the Commission relies on in its final analysis, is an estimate of a broker-dealer's cost to outsource data reporting services as part of a bundle of services from a service bureau; for smaller broker-dealers, it is assumed to include provision of an order management system and market connectivity.²⁵⁵³

To estimate costs of CAT Data reporting by the service bureaus, the Commission assumes that the pricing function used to estimate current costs will apply for CAT Data reporting, but the costs in relation to the number of ROEs will increase because some events that are excluded from OATS (like proprietary orders originated by a trading desk in the ordinary course of a member's market making activities), will be included in CAT.²⁵⁵⁴

As discussed in detail in the Notice, application of the model to data provided by FINRA allows the Commission to estimate pre-CAT outsourcing costs for broker-dealers, as well as projected costs under the CAT NMS Plan. The Commission estimates that the 806 broker-dealers that each report fewer than 350,000 OATS ROEs monthly spend an aggregate \$100.1 million on annual outsourcing costs. Under the CAT NMS Plan, the Commission estimates that these 806 broker-dealers will spend \$100.2 million on annual outsourcing costs. As in the Notice, the Commission recognizes that the magnitude of this increase is quite small,

²⁵⁵² The Commission's estimate of concavity relies on data from exchanges that do not feature inverted pricing. On "inverted" exchanges, the party with the resting order pays a fee while her counterparty that receives immediate execution earns a rebate.

²⁵⁵³ In conversations with Commission Staff, service bureaus related that some very large clients provide their own order-handling system and market connectivity.

²⁵⁵⁴ Although the pricing function is assumed constant, as explained in the Notice, broker-dealer costs would increase because the number of ROEs they report through their service bureaus would increase under the Plan. See Notice, supra note 5, at 30721.

but this is driven by the fact that the vast majority of firms that are assumed to outsource had very low regulatory data reporting levels at the time the estimates were made.²⁵⁵⁵

As discussed in the Notice, firms that outsource their regulatory data reporting face additional internal staffing costs associated with this activity. Based on conversations with market participants described in the Notice, the Commission estimates that these firms currently have 0.5 full-time employees devoted to regulatory data reporting activities. The Commission further estimates that these firms will need one full-time employee for one year to implement CAT reporting requirements, and 0.75 full-time employees on an ongoing basis to maintain CAT reporting.²⁵⁵⁶

As discussed in the Notice, in addition to broker-dealers that currently report to OATS, the Commission estimates that there are 799 broker-dealers that are excluded from OATS reporting rules due to firm size, or exempt because all of their order flow was routed to a single OATS reporter, such as a clearing broker, that will have CAT reporting responsibilities.²⁵⁵⁷ The Commission assumes that these broker-dealers will have low levels of CAT reporting, similar to

²⁵⁵⁵ The average broker-dealer in this category reported 15,185 OATS ROEs from June 15 – July 10, 2015; the median broker-dealer reported 1,251 OATS ROEs. Of these broker-dealers, 39 reported more than 100,000 OATS ROEs during the sample period. *Id.* at 30722.

²⁵⁵⁶ Based on discussions with broker-dealers described in the Notice, the Commission believes that very small broker-dealers are unlikely to have employees entirely dedicated to regulatory data reporting. Instead, other employees generally have duties that include dealing with service bureau matters and answering regulatory inquiries. The Commission assumes a full-time employee costs \$424,350 per year. *Id.* at 30714, n.880.

²⁵⁵⁷ In discussions with Commission Staff, FINRA has stated that there are currently 54 OATS-exempt broker-dealers and 691 OATS-excluded firms.

those of the typical Outsourcers that currently report to OATS.²⁵⁵⁸ For these firms, the Commission assumes that under CAT they will incur the average estimated outsourcing cost of firms that report fewer than 350,000 OATS ROEs per month, which is \$124,373 annually. Furthermore, because these firms have more limited data reporting requirements than other firms, the Commission assumes these firms have only 0.1 full-time employees dedicated to regulatory data reporting activities. The Commission assumes that these firms will require 2 full-time employees for one year to implement the CAT NMS Plan and 0.75 full-time employees annually to maintain CAT Data reporting.²⁵⁵⁹

The Commission, however, believes for reasons described in more detail in the Notice that there are three other categories of broker-dealers not reflected in the above detailed cost estimates that do not currently report OATS data but could be CAT Reporters. First, there are at least 14 ELPs that did not carry customer accounts; these firms are not FINRA members and thus have no regular OATS reporting obligations.²⁵⁶⁰ The Commission believes that it is likely that these broker-dealers already have self-reporting capabilities in place because each is a member of an SRO that requires the ability to report to OATS on request. The second group of broker-dealers that are not encompassed by the cost estimates of FINRA member broker-dealers

²⁵⁵⁸ Exemption or exclusion from OATS may be based on firm size or type of activity. Broker-dealers with exemptions or exclusions that relate to firm size are presumably relatively inactive. However, some firms may be exempted or excluded because they route only to a single OATS-reporting broker-dealer; this could encompass large firms that would be more similar to Insourcers.

²⁵⁵⁹ See supra note 2556.

²⁵⁶⁰ The category of Insourcers that do not currently report OATS data includes firms that have multiple SRO memberships that exclude FINRA. This category includes Options Market Makers and at least 14 ELPs; these are firms that carry no customer accounts and directly route proprietary orders to Alternative Trading Systems.

discussed above are those that make markets in options and not equities. Although not required by the CAT NMS Plan to report their option quoting activity to the Central Repository,²⁵⁶¹ these broker-dealers may have customer orders and other activity that will cause them to incur a CAT Data reporting obligation. As explained in the Notice, based on CBOE membership data, the Commission believes that there are 31 options market-making firms that are members of multiple SROs but not FINRA.²⁵⁶² The third group comprises 24 broker-dealers that have SRO memberships only with CBOE; the Commission believes that this group is comprised primarily of CBOE floor brokers and, further, believes these firms will incur CAT implementation and ongoing reporting costs similar in magnitude to small equity broker-dealers that currently have no OATS reporting responsibilities because they will face similar tasks to implement and maintain CAT reporting. As explained in the Notice, the Commission assumes the 31 options market-making firms and 14 ELPs are typical of the Reporters Study's large, non-OATS reporting firms because this group encompasses large broker-dealers that are not FINRA members, a category that excludes any broker-dealer that carries customer accounts and trades in equities. As in the Notice, for these 45 firms, the Commission relies on cost estimates from the Reporters Study.²⁵⁶³

²⁵⁶¹ See Exemption Order, supra note 21, at 11857–58.

²⁵⁶² The Commission identified 39 CBOE-member broker-dealers that were not FINRA members, but were members of multiple SROs; 8 of these broker-dealers were previously identified as ELPs, leaving 31 firms with multiple SRO memberships that were unlikely to be CBOE floor brokers.

²⁵⁶³ The Commission recognizes that additional broker-dealers may be members of neither FINRA nor CBOE, yet may incur CAT reporting obligations if the Plan is approved. The Commission has determined that categorizing additional broker-dealers that are currently classified as exempt or excluded FINRA members as non-FINRA members would not change the cost estimates because these groups have identical estimated per-firm costs.

As discussed in detail in the Notice, pre-CAT Data reporting cost estimates range from \$167,000 annually for floor brokers and firms that are exempt from OATS reporting requirements to \$8.7 million annually for firms that report more than 350,000 OATS ROEs per month (“Insourcers”). Estimates of one-time implementation costs range from \$424,000 for OATS reporters that are assumed to outsource (“OATS Outsourcers”) to \$7.2 million for Insourcers, and ongoing annual costs range from \$443,000 annually for firms that are assumed to outsource (OATS Outsourcers, New Outsourcers and Floor Brokers) to \$4.8 million for Insourcers.

Table 4 summarizes the Commission’s updated estimates of costs to broker-dealers expected from the approval of the CAT NMS Plan. The Commission estimates that broker-dealers spend, in aggregate, approximately \$1.6 billion annually on current regulatory data reporting activities. The Commission estimates approximate one-time implementation costs of \$2.2 billion, and annual ongoing costs of CAT reporting of \$1.5 billion.²⁵⁶⁴ The Commission notes that its estimate of ongoing CAT reporting costs of \$1.5 billion is slightly lower than current data reporting costs of \$1.6 billion. As explained in the Notice, this differential is driven by expectations of reductions in data reporting costs reported by large OATS-reporting broker-dealers in the Reporters Study survey.²⁵⁶⁵ The Commission estimates that all other categories of broker-dealers will face significant increases in annual data reporting costs. Also, the

²⁵⁶⁴ As noted in Section V.F.1.b, supra, the Plan as amended in February 2016 states that the Participants will recover their costs of developing the Plan (currently \$8.8 million) from broker-dealers. This constitutes a transfer from broker-dealers to Participants, but does not change the aggregate cost of the Plan to market participants.

²⁵⁶⁵ In the Reporters Study, Large OATS Reporters cite average current data reporting costs of \$8.32 million and Approach 1 maintenance costs of \$4.5 million annually. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7.(b)(ii)(C).

Commission acknowledges that there are some broker-dealers that would be classified as Outsourcers or new reporters for which the Commission’s cost estimates rely on the Outsourcing Cost Model, and the additional implementation costs that these firms face due to clearing for other broker-dealers or supporting introducing broker-dealers are not captured by these estimates.

Table 4: Estimated Broker-Dealer Costs for CAT NMS Plan²⁵⁶⁶

	Number	Current Costs	Implementation	System Retirement	Ongoing
Broker-Dealers:					
Insourcers	126	\$1,097,130,000	\$911,144,052	\$12,600,000	\$599,285,000
Outsourcers	806	\$271,113,000	\$342,026,100	\$8,060,000	\$356,764,000
New Small Firms	799	\$133,137,000	\$678,111,300	\$7,990,000	\$353,666,000
ELPs	14	\$20,068,000	\$54,257,245	\$1,400,000	\$45,160,000
Options Market Makers	31	\$44,437,000	\$120,141,043	\$3,100,000	\$99,998,000
Options Floor Brokers	24	\$3,999,000	\$20,368,800	\$240,000	\$10,623,000
Additional Costs:					
NEW: Allocation time			\$44,050,000		\$5,035,830
NEW: Quote sent time			\$17,400,000		\$11,880,000
NEW: Development Cost Recoup			\$8,800,000		
Total BD	1800	\$1,569,884,000	\$2,196,298,540	\$33,390,000	\$1,482,411,830

The Commission recognizes both that there is uncertainty in these cost estimates and that these cost estimates do not include additional costs that Outsourcers and new reporters that clear for other broker-dealers or support introducing broker-dealers will incur. As explained above, because the Commission’s Outsourcing Cost Model does not and cannot incorporate these costs, the cost estimates here could underestimate the costs for these firms and, as a result, the total

²⁵⁶⁶ Additional Costs are discussed in Section V.F.1.c(1), *supra*. See additional discussion in Section V.F.3.a(4), *infra* and Section V.F.a(6), *infra*.

broker-dealer costs. Because Bids are not yet final, the Commission believes that its cost estimates, while reliable in light of available data and information, could differ from actual costs the broker-dealers will incur and that broker-dealers will not know the true magnitude of their costs until they can analyze the Technical Specifications.

d. Costs to Service Bureaus

In the Notice, the Commission considered whether to include the implementation and ongoing costs to service bureaus in the aggregate costs of the Plan.²⁵⁶⁷ The Commission preliminarily believed that costs that service bureaus would face to implement CAT should be included as part of the aggregate costs of CAT. While the CAT NMS Plan does not require the use of service bureaus to report CAT Data, the Commission recognized that the most cost effective manner to implement the Plan likely will be for most market participants to continue their current practice of outsourcing their regulatory data reporting to one or more service bureaus. By doing so, the roughly 1,600 broker-dealers predicted to outsource would avoid incurring a significant fraction of CAT implementation costs; instead, service bureaus would incur implementation costs on their behalf. Based on conversations with market participants, the Commission believed that these implementation costs are likely to pass-through to broker-dealers that outsource data reporting, because service contracts between broker-dealers and service bureaus are renegotiated periodically, and approval of the CAT NMS Plan could trigger renegotiation as the bundle of services provided would materially change.

The Commission, however, preliminarily believed that the ongoing costs of CAT Data reporting by service bureaus would be duplicative of costs incurred by broker-dealers. The

²⁵⁶⁷ See Notice, supra note 5, at 30726.

aggregate fees paid by Outsourcers to service bureaus cover the service bureaus' costs of ongoing data reporting. To include ongoing service bureau costs as a cost of CAT would double-count the costs that broker-dealers incur for CAT Data reporting.

The CAT NMS Plan estimates aggregate implementation costs of \$51.6 million to \$118.2 million for service bureaus, depending on the particular data ingestion format.²⁵⁶⁸ Aggregate ongoing annual cost estimates ranged from \$38.6 million to \$48.7 million. To provide a conservative estimate of aggregate cost estimates for CAT, the Commission included only the maximum implementation cost that vendors would likely face of \$118.2 million.

One commenter provided additional information regarding service bureau implementation costs.²⁵⁶⁹ The commenter stated that these firms will face \$1.3 million in implementation costs related to providing allocation timestamps, and that these costs were not covered by the Vendors Study conducted by the Participants. The Commission believes this estimate is reliable because the commenter is an industry trade group with members that can provide cost estimates to the commenter. Furthermore, the Commission believes it is possible that at the time the Vendor's Study was conducted, industry members may not have been aware that allocation timestamps would be required in CAT. Consequently, the Commission is updating its analysis to account for these costs.

²⁵⁶⁸ The Vendor Survey asked about the costs under two different data ingestion formats, Approach 1 and Approach 2. Approach 1 would allow broker-dealers to submit data to the Central Repository using their choice of existing industry messaging protocols, while Approach 2 would specify a pre-defined format. Id. at Section 30726.

²⁵⁶⁹ FIF Letter at 87–88.

The Commission continues to believe that the only relevant cost for service bureaus to include in the aggregate costs of complying with the Plan is the estimated implementation cost which as adjusted is \$119.5 million.

2. Aggregate Costs to Industry

a. Estimated Costs of Compliance

In the Notice, the Commission preliminarily estimated that industry would spend \$2.4 billion to implement CAT, and \$1.7 billion per year in ongoing annual costs.²⁵⁷⁰ The Commission calculated these numbers as the sum of its estimates for the Central Repository, Participants, broker-dealers, and service bureaus. These compare to Plan estimates of initial aggregate costs to industry of \$3.2 billion to \$3.6 billion and annual ongoing costs of \$2.8 billion to \$3.4 billion.²⁵⁷¹

In terms of magnitudes of aggregate costs, the Notice discussed that costs to the 126 largest broker-dealers that currently report OATS data would be the largest driver of implementation costs, accounting for 38.3% of CAT implementation costs. Although these broker-dealers would face significant costs in implementing CAT, the Reporters Study survey results suggest that they anticipate lower ongoing reporting costs than they currently incur (\$599 million annually in expected aggregate costs versus \$1.1 billion annually in current aggregate regulatory data reporting costs). For all other categories of broker-dealers, the Commission estimated ongoing annual costs to be higher than current reporting costs. While broker-dealers are anticipated to bear the greatest share of costs associated with CAT, the Commission discussed the possibility that these costs would be passed on to investors.

The Commission received comments on its preliminary estimates of aggregate costs to the industry. One commenter provided alternative cost estimates, citing costs for financial institutions of \$2 to 40 million during initial years of CAT, and ongoing costs for CAT

²⁵⁷⁰ See Notice, supra note 5, at 30726–30.

²⁵⁷¹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iv)(A)(5).

infrastructure of \$28 to 36 million annually based on an analysis released by the Office of Comptroller of the Currency related to the Volcker Rule.²⁵⁷² Another commenter noted that while aggregate costs are not certain, they will be measured in billions of dollars.²⁵⁷³ The same commenter also noted that the costs of CAT would be passed on to investors.²⁵⁷⁴

The Commission does not believe, however, that these comments require revision of its analysis of the aggregate costs of the Plan.

With respect to the comment that suggested that the Commission use Volcker Rule cost estimates to estimate the costs of the Plan, the Commission believes that these estimates are not relevant to the Plan.²⁵⁷⁵ The requirements of the Plan are significantly different than the requirements of the Volcker Rule, which is primarily focused on restricting certain trading activities and investments of banking entities, rather than the centralization and standardization of regulatory data reporting. Further, while the Commission acknowledges that some market participants will be subject to both the Volcker Rule and CAT, the Commission notes that market participants affected by the Plan are not necessarily comparable to banking entities affected by the Volcker Rule, and thus cost estimates for changes to their business processes would not be applicable to typical CAT reporters, which tend to be smaller institutions. The commenter's suggested estimate of \$2 million per year for affected market participants that are not large financial institutions does not seem reasonable because the majority of data that must be collected under CAT is already hosted by many of these firms' service providers, and much of

²⁵⁷² Data Boiler Letter at 14–15.

²⁵⁷³ FSR Letter at 9–10.

²⁵⁷⁴ FSR Letter at 9–10.

²⁵⁷⁵ Data Boiler Letter at 14–15.

this data is already reported to a regulatory data reporting system (OATS) for a far lower cost than the \$2 million estimate.²⁵⁷⁶

The Commission agrees with the comment regarding the uncertainty of the cost estimates,²⁵⁷⁷ and notes that it recognized in the Notice the significant uncertainty surrounding the actual implementation costs of CAT and the actual ongoing broker-dealer data reporting costs if the Plan were approved and is cognizant of the magnitude of the aggregate costs.²⁵⁷⁸ The Commission continues to recognize that the methodology and data limitations used to develop these cost estimates could result in imprecise estimates that may significantly differ from actual costs. The Commission continues to believe, however, that it is using its best judgment to assess available information and data to provide analysis and estimates of the costs of the CAT NMS Plan. With regard to the comment that CAT costs will be passed on to investors,²⁵⁷⁹ the Commission acknowledged in the Notice and continues to believe that it is possible that some or most of the costs of CAT will be passed on to investors.

The Commission has, however, updated its aggregate cost estimates to account for the updates to Central Repository, Broker-Dealer, Participant and Service Bureau cost estimates which incorporate updates due to modifications of the Plan. In aggregate, the Commission believes that that industry will spend \$2.4 billion to implement CAT, and \$1.7 billion per year in ongoing annual costs. Table 5 below shows these new cost estimates and aggregate costs to industry. Some individual estimates have changed from estimates presented in the Notice for a

²⁵⁷⁶ See Notice, supra note 5, at 30722.

²⁵⁷⁷ FSR Letter at 9–10.

²⁵⁷⁸ See Notice, supra note 5, at 30708.

²⁵⁷⁹ FSR Letter at 9–10.

number of reasons. First, the Commission is now recognizing system retirement costs of \$55 million. Also, estimates for Participant costs have increased to account for two additional Participants that were not covered by the Participants Study, and to account for the cost of additional reporting required by amendments to the Plan. Finally, estimates for Central Repository implementation and ongoing costs have been updated to reflect the Participants' current estimates. As Table 5 shows, however, the changes to the cost estimates do not affect the rounded estimates of implementation and ongoing costs presented in the Notice. The Commission recognizes that these cost estimates do not specifically itemize the costs of certain modifications to the Plan or respond to information provided by certain Commenters related to the costs of individual elements of the Plan. The Commission discusses these in detail in Section VI.F.3 below.

Table 5

	Commission's Estimate				
	Number	Current Costs	CAT		
			Implementation	System Retirement	Ongoing
Central Repository		\$0	\$65,000,000		\$55,000,000
Participants (all, 21)		\$170,326,730	\$37,713,757	\$342,632	\$114,271,857
Service Bureaus (all, 13)		Unknown	\$119,500,000	\$21,300,000	Excluded
Broker Dealers:					
Insourcers	126	\$1,097,130,000	\$911,144,052	\$12,600,000	\$599,285,000
Outsourcers	806	\$271,113,000	\$342,026,100	\$8,060,000	\$356,764,000
New Small Firms	799	\$133,137,000	\$678,111,300	\$7,990,000	\$353,666,000
ELPs	14	\$20,068,000	\$54,257,245	\$1,400,000	\$45,160,000
Options Market Makers	31	\$44,437,000	\$120,141,043	\$3,100,000	\$99,998,000
Options Floor Brokers	24	\$3,999,000	\$20,368,800	\$240,000	\$10,623,000
Additional Costs:					
NEW: Allocation time			\$44,050,000		\$5,035,833
NEW: Quote sent time			\$17,400,000		\$11,880,000
NEW: Development Cost Recoup			\$8,800,000		
Total BD	1800	\$1,569,884,000	\$2,196,298,540	\$33,390,000	\$1,482,411,833
Total Industry		\$1,740,210,730	\$2,418,512,297	\$55,032,632	\$1,651,683,690

b. System Retirement and Duplicative Reporting Costs

In the Notice, the Commission considered whether to include in its estimates of aggregate compliance costs the costs of system retirement and the costs of duplicative reporting if Participants and broker-dealers need to maintain and report to current systems after commencing reporting to the Central Repository.

The Commission considered the costs for system retirement provided in the Plan, which discussed significant costs (\$2.6 billion) for retirement of current regulatory reporting

systems.²⁵⁸⁰ The Commission did not include those costs in its estimate of the aggregate costs of the Plan, for several reasons. First, the Commission preliminarily believed that the cost estimates provided in the Plan were unlikely to accurately represent the actual costs industry would face in retiring duplicative reporting systems.²⁵⁸¹ In particular, for the majority of broker-dealers that outsource, system retirement would affect few in-house systems; these broker-dealers would likely adapt the systems that interface with service bureaus for current regulatory data reporting to interface for CAT Data reporting. Further, for broker-dealers that self-report regulatory data, the Commission could not determine the source of the costs of system retirement that were estimated in the Plan and the magnitude of estimated costs led the Commission to doubt that estimates included only costs of retiring systems.²⁵⁸² Second, the retirement of current regulatory reporting systems was not a requirement of the Plan and the timeline and process for their retirement was uncertain.

While the Commission's cost estimates did not recognize explicit system retirement expenses, they also did not explicitly recognize savings from elimination of these systems, though they were recognized qualitatively. In the Notice, the Commission discussed its preliminary belief that this approach was conservative in the sense that system retirement costs would likely be mitigated by incorporation of current reporting infrastructure into CAT reporting

²⁵⁸⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iv)(A)(5).

²⁵⁸¹ At its simplest level, ceasing reporting activities would include scrapping IT hardware dedicated to the endeavor and terminating the employees responsible for such regulatory data reporting. The Commission recognized that there are costs associated with those activities, but did not preliminarily believe their magnitude (estimated in the Plan as \$2.6 billion) should approach or exceed the magnitude of costs of CAT implementation (estimated in this analysis as \$2.4 billion). See Notice, supra note 5, at 30726–28.

²⁵⁸² Id.

infrastructure, while cost savings associated with industry's need to maintain fewer regulatory data reporting systems were not explicitly recognized. While the Commission did not include explicit system retirement costs, the Commission did recognize that industry would experience a costly period of duplicative reporting if the CAT NMS Plan were approved, and the Commission stated that it believed it was possible that these costs could be conflated with actual retirement costs estimated in the Plan.

In the Notice, the Commission stated its preliminary belief that the period of duplicative reporting would likely constitute a major cost to industry for several reasons.²⁵⁸³ These reasons included the length of the duplicative reporting period; constraints on the capacity of industry to implement changes to regulatory reporting infrastructure that might cause market participants to implement changes using less cost-effective resources;²⁵⁸⁴ and the inability of some market participants to implement duplicative reporting in house, necessitating that they seek service bureau relationships to accomplish their CAT reporting requirements.

Based on data provided in the Plan, the Commission preliminarily believed that the period of duplicative reporting anticipated by the Participants would likely last for 2 to 2.5 years.²⁵⁸⁵ This time period involved four steps. Step 1, which could take 12 to 18 months, involves the SROs identifying duplicative SRO Rules and systems and Commission rulemaking. Step 2, which would last six months, involves preparations by the SROs to file rule changes, followed by Step 3, lasting three months, for the Commission to approve such rule changes. The last step, Step 4, involves implementation, and the Commission estimated it could last from 90

²⁵⁸³ Id. at 30728.

²⁵⁸⁴ Id.

²⁵⁸⁵ Id. at 30726–30.

days to six months, during which time the Plan stated that the Participants could consider when the quality of CAT Data would be sufficient to meet surveillance needs.

In the Notice, the Commission discussed its preliminary belief that the current data reporting costs of \$1.7 billion per year constituted an estimate of the cost per year to industry of duplicative reporting requirements, as it represents the cost of duplicative reporting to industry if there are no efficiencies that arise when a market participant has to report a subset of already centralized regulatory data to other regulatory data reporting systems.²⁵⁸⁶ The Commission did not believe that duplicative reporting costs should be added to the estimated aggregate costs of the CAT NMS Plan. The Commission discussed its belief that that the aggregate costs above represent the total costs of the Plan, and do not account for the differential between these costs and the costs the industry currently incurs for regulatory data reporting and maintenance. During the period of duplicative reporting, industry would incur the aggregate costs of accomplishing CAT reporting described above, plus the costs of current data reporting, which the Commission used as an estimate of duplicative reporting costs. The Commission noted that market participants would incur costs equal to current data reporting costs before system retirement and CAT implementation (because current regulatory data reporting would continue), or as duplicative reporting costs from Plan implementation until system retirement. Consequently, the Commission preliminarily believed these costs should not be considered as costs attributable to approval of the Plan, because market participants would bear these costs whether the Plan is approved or not.

²⁵⁸⁶ Assuming that OATS, for example, is a subset of CAT, producing OATS data from the same database that produces CAT data might be less expensive than creating a separate infrastructure to report OATS data during the period of duplicative reporting.

The Commission received comments on the costs of duplicative reporting. Several commenters agreed with the Notice that duplicative reporting would constitute a major cost to industry,²⁵⁸⁷ with a few of these commenters providing examples of the types of costs.²⁵⁸⁸ Examples of burdens provided by these commenters include dual reporting complexities such as conflicting reporting requirements,²⁵⁸⁹ varied corrections to the same errors across different systems,²⁵⁹⁰ legal and compliance confusion,²⁵⁹¹ costs of maintenance of duplicative reporting systems such as infrastructure, storage, technical, and staffing resources,²⁵⁹² and costs associated with making changes to redundant systems.²⁵⁹³ No commenters agreed with the Commission's preliminary belief²⁵⁹⁴ that reporters might experience efficiencies during duplicative reporting, with one commenter claiming that its costs would double.²⁵⁹⁵

The Commission received comments on the measurement of the duplicative reporting period as well as the necessity and impact of the length of the duplicative reporting period. Some commenters indicated that the lengthy expected duplicative reporting period was unnecessary, redundant and/or avoidable²⁵⁹⁶ and two commenters indicated that the length of the

²⁵⁸⁷ FIF Letter at 5; SIFMA Letter at 5; FSR Letter at 10; Fidelity Letter at 4–5; TR Letter at 2; KCG Letter at 3; MFA Letter at 9; DAG Letter at 2.

²⁵⁸⁸ FIF Letter at 30; SIFMA Letter at 5; Fidelity Letter at 4–5; TR Letter at 2.

²⁵⁸⁹ FIF Letter at 30.

²⁵⁹⁰ FIF Letter at 30.

²⁵⁹¹ TR Letter at 2.

²⁵⁹² FIF Letter at 30; SIFMA Letter at 5.

²⁵⁹³ Fidelity Letter at 5; KCG Letter at 3.

²⁵⁹⁴ See Notice, *supra* note 5, at 30729.

²⁵⁹⁵ TR Letter at 2.

²⁵⁹⁶ SIFMA Letter at 5; Data Boiler Letter at 36; Fidelity Letter at 4; DAG Letter at 2.

duplicative reporting period was a major factor in the duplicative reporting costs.²⁵⁹⁷ A commenter suggested that it was feasible for the Commission and SROs to complete Step 1 before the milestone for the publication of Technical Specifications (one year before Industry Members other than Small Industry Members are required to begin reporting), which would speed up systems retirement by 18 to 24 months relative to the Commission's estimate.²⁵⁹⁸ The same commenter also suggested that Step 4 was longer than necessary to achieve acceptable data quality.²⁵⁹⁹ One commenter indicated that the length of the duplicative reporting period was actually 3 to 3.5 years instead of the Commission's estimate of 2 to 2.5 years for firms that do not meet the definition of Small Industry Member.²⁶⁰⁰

The Commission also received comments discussing the system retirement costs presented in the Plan and discussed by the Commission in the Notice. One Commenter disagreed with the Plan's estimate that it should cost \$2.6 billion to retire redundant systems.²⁶⁰¹ Instead, the commenter suggested that a more accurate cost estimate would range from \$10,000 to \$100,000 per firm. This commenter did not provide an explanation of the how the commenter derived this estimated range and sought more information on the Plan's estimate.

The Participants' Response Letter II discussed comments related to system retirement.²⁶⁰² The Participants noted that Small Industry Members can begin reporting earlier on a voluntary basis, and stated that the Participants will consider a rule change that would accelerate reporting

²⁵⁹⁷ FIF Letter at 5; DAG Letter at 2.

²⁵⁹⁸ FIF Letter at 6.

²⁵⁹⁹ FIF Letter at 6.

²⁶⁰⁰ TR Letter at 2.

²⁶⁰¹ SIFMA Letter at 7.

²⁶⁰² Response Letter II at 19–20.

for small Industry Members that are OATS reporters. The Participants also discussed their commitment to eliminating duplicative reporting systems as quickly as possible.²⁶⁰³ They stated that they are incented to eliminate duplicative systems because maintaining the systems is costly.

The Participants also outlined a revised timetable for system retirement that differs from the Plan as filed.²⁶⁰⁴ Under the Participants' proposal, Step 1 would be completed within 9-12 months after the Plan's approval. Step 2, in which Participants file rule changes with the Commission, would end six months after the conclusion of Step 1. The Participants also discussed an exemption for individual CAT reporters from duplicative reporting.²⁶⁰⁵

The Commission has considered the comments received, the Participants' response, and the modifications to the Plan, and is revising its analysis of the costs of duplicative reporting and system retirement as described below. The Commission acknowledges additional uncertainty regarding duplicative reporting due to its revised belief that efficiencies in duplicative reporting are less likely than it believed at the time of the Notice, but continues to believe that duplicative reporting could cost up to \$1.7 billion per year. However, as discussed below, the Commission now believes that the period of duplicative reporting is likely to be shorter than was anticipated in the Notice, and that the cost will therefore be reduced. Based on comments received, the Commission has revised its estimate of system retirement costs and now believes the aggregate cost to industry will be approximately \$55 million.

Consistent with its position in the Notice, the Commission agrees with commenters that duplicative reporting will constitute a major cost to industry, and recognizes that conflicting

²⁶⁰³ Response Letter II at 20–21.

²⁶⁰⁴ Response Letter II at 21–25.

²⁶⁰⁵ Response Letter II at 26; see also Section IV.D.9, supra.

reporting requirements, varied corrections to the same error across different systems, legal and compliance confusion will all contribute to these costs. Further, the Commission agrees that maintenance of duplicative reporting systems will entail commitment of additional resources such as infrastructure, storage, technical, and staffing resources, as well as costs associated with making changes to redundant systems. However, the Commission notes that modifications to the Plan that minimize changes to potentially duplicative systems during the period of duplicative reporting may mitigate some of these costs.²⁶⁰⁶ Regarding the comment that some market participants will see their data reporting costs double during the period of duplicative reporting, the Commission agrees and believes that calculation is reflected in the estimates in the Notice, as its estimate of duplicative reporting costs of \$1.7 billion per year is in line with the projected industry costs of ongoing CAT reporting of \$1.7 billion per year.²⁶⁰⁷

In response to the comment that duplicative reporting does not create efficiencies, the Commission, in the Notice, explained that it expected some cost efficiencies, but expressed uncertainty about those efficiencies. Because of that uncertainty and in light of the comment, the Commission acknowledges that duplicative reporting may not result in efficiencies.

Based on the changes to the Plan, the Commission now believes that the duplicative reporting period may be shorter than estimated in the Notice. As discussed previously, the

²⁶⁰⁶ See Section IV.D.9.a(2), supra (explaining that the Commission is amending Section C.9 of Appendix C of the Plan to state that between the Effective Date and the retirement of the Participants' duplicative systems, each Participant, to the extent practicable, will attempt to minimize changes to those duplicative systems.

²⁶⁰⁷ See Notice, supra note 5, at 30729. As discussed above, the Commission estimates that market participants currently spend \$1.7 billion for regulatory data reporting, and estimates that market participants will spend \$1.7 billion to report regulatory data under CAT. During years of duplicative reporting, the Commission estimates market participants would spend \$3.3 billion in regulatory data reporting, which is approximately double the \$1.7 billion they currently spend. See Section V.F.2, supra.

Commission has revised the milestones for system retirement, which may decrease the duplicative reporting period compared to the period anticipated at the time of the Notice.²⁶⁰⁸ Specifically, the gap analyses for major duplicative systems (Step 1) have been substantially completed 3-3.5 years sooner²⁶⁰⁹ than was envisioned in the Notice.²⁶¹⁰ Furthermore, the Plan as amended now calls for the Participants to file with the Commission within 6 months after Plan approval (Step 2) rule change proposals.²⁶¹¹ Consequently, Step 3 (Commission review of rule modification filings) is expected to commence six months after Plan approval, and, as discussed in the Notice, is expected to take three months to one year. As a result, Step 4 (Participant implementation of rule changes) is the only system retirement step that the Commission expects to extend past when Large Industry Members begin reporting to the Central Repository.

The Commission recognizes that there remains significant uncertainty as to when system retirement will occur, because the actual retirement of such rules and systems will depend upon several factors. In particular, the Commission notes that the retirement of systems will not occur

²⁶⁰⁸ See Section IV.D.9.a(1), supra.

²⁶⁰⁹ The Plan states that Step 1 would end 1-1.5 years after large Industry Members begin reporting to the Central Repository. Large Industry Members will begin reporting 2 years after the Plan is approved.

²⁶¹⁰ See Section IV.D.9, supra.

²⁶¹¹ These proposals must consider at least three factors: 1) specific standards of data accuracy and reliability, including, but not limited to, whether the attainment of a certain Error Rate is reached, 2) whether the availability of Small Industry Member data two years after Plan approval would facilitate more expeditious systems retirement, and 3) whether individual Industry Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy and reliability standards. See Section IV.D.9.a, supra. The Commission analyzes these amendments below.

until the CAT Data is of sufficient quality and when the CAT system has been fully implemented for all reporters.²⁶¹²

With respect to the quality of the CAT Data, as discussed above, in the Notice the Commission estimated that the period of duplicative reporting was likely to last for 2 to 2.5 years. At the time of the Notice, the Commission's estimate suggested that the length of the rule modification steps within the four step process discussed above would primarily determine the length of the overall duplicative reporting period, although it recognized that data quality could delay the retirement of duplicative systems.²⁶¹³ The Commission recognized in the Notice that Step 4 (implementation of system retirement plans) required not only the completion of Steps 1 through 3 but also that data quality within the Central Repository had to be adequate for the SRO's regulatory needs.

The Commission now believes that, while the revision of the system retirement milestones may decrease the length of the duplicative reporting period, this change will also increase the probability that Industry Member data quality might delay system retirement because Industry Members will have less experience reporting CAT Data when the four step process reaches the point where data quality could delay system retirement.

Additionally, the Commission believes it is possible that, as one commenter suggested,²⁶¹⁴ the phased implementation of CAT reporting for Small Industry Members could result in up to one year of duplicative reporting expense for Large Industry Members.

Specifically, Large Industry Member data quality may reach a level that is sufficient for SRO

²⁶¹² See Section IV.D.9, supra.

²⁶¹³ See Notice, supra note 5, at 30729.

²⁶¹⁴ TR Letter at 2.

regulatory needs prior to the commencement of reporting by Small Industry Members to the Central Repository, but retirement of systems might not occur until after those Small Industry Members begin reporting.²⁶¹⁵ Further, it is possible that, as a result of having commenced reporting at a later date, Small Industry Members' data may not reach an acceptable quality threshold for some period after Large Industry Members' data has reached an acceptable quality threshold. The phased implementation schedule may therefore limit the extent to which the Plan amendments accelerating the timeframe for initial rule change proposals shorten the duplicative reporting period and thereby reduce the costs of duplicative reporting. Despite this caveat, for reasons explained below, the Commission believes that the amendments could significantly shorten this period and reduce costs.

In particular, at least four amendments or other factors might mitigate the impact of phased implementation on duplicative reporting and costs. First, the Commission has amended the Plan to require the Participants' to include, in their filings to retire systems, specific standards of data accuracy and reliability, including, but not limited to, whether the attainment of a certain Error Rate is reached,²⁶¹⁶ which should incentivize accurate data reporting by both Large and Small Industry Members and reduce the duplicative reporting period. Second, an amendment to the Plan requires Participants' rule change proposals to consider whether individual Industry

²⁶¹⁵ The Commission's analysis of costs is not based on small versus large Industry Members, but rather is based on Insourcers versus Outsourcers. It is reasonable to assume that Insourcers, ELPs and Option Market Makers are large Industry Members because these market participants can be characterized as having high activity levels that would require capital levels that exceed the upper threshold for small Industry Members. For these three groups of CAT reporters, one year of duplicative reporting is estimated to cost \$1.2 billion. See estimates of current data reporting costs in Section V.F.1.c(2)B, supra.

²⁶¹⁶ See Section IV.D.9.a.(2), supra. Note that such proposals are subject to Commission approval. In reviewing such a proposal, the Commission would consider the appropriateness, and the consistency with the Act, of the proposal.

Members can be exempted from reporting to duplicative systems once their CAT reporting meets specified accuracy and reliability standards.²⁶¹⁷ If the Participants determine to grant such individual exemptions to some Industry Members prior to all Industry Members' data reaching an acceptable quality threshold, the economic impact of the phased implementation schedule could be less. Third, the Participants have indicated that OATS-reporting Small Industry Members can begin voluntarily reporting at the same time as Large Industry Members, and the Commission encourages the Participants and the Plan Processor to work with these Small Industry Members to enable them to begin reporting to CAT, on a voluntary basis, at the same time that Large Industry Members are required to begin reporting or as soon as practicable. The Commission recognizes, however, that incentives for Small Industry Members to begin reporting voluntarily at an earlier time are limited because accelerating CAT reporting imposes costs on CAT reporters, while the benefits of earlier system retirement accrue primarily to Large Industry Members that face a longer period of duplicative reporting. As a result, the extent to which accelerating commencement of voluntary reporting mitigates the economic impact of the phased implementation schedule may be limited. Therefore, the Commission believes that the amendment to require that the Participants consider whether the availability of Small Industry Member data two years after Plan approval would facilitate more expeditious systems retirement²⁶¹⁸ could help to avoid an extension of the duplicative reporting period attributable to the phased implementation schedule.

²⁶¹⁷ Id.

²⁶¹⁸ Id.

The Commission has also considered the comment that proposed alternative estimates for system retirement costs²⁶¹⁹ and has revised its economic analysis accordingly. Specifically, the Commission believes that this commenter has the expertise to provide reliable estimates because this industry group's members can inform it of their costs; furthermore, the Commission believes the estimates this commenter provided seem more reasonable than estimates provided in the Plan because estimates provided in the Plan exceeded the Commission's estimate of costs of implementing the Plan.²⁶²⁰

To estimate the aggregate costs of system retirement, the Commission assumes that the \$100,000 estimate would be appropriate for Insourcers and the \$10,000 estimate would be appropriate for Outsourcers.²⁶²¹ The Commission assumes that for firms that do not currently report to OATS, firms that were considered large for cost estimates (ELPs and Options Market Makers) will have similar system retirement costs to Insourcers because they are more similar in size and scope of operations to Insourcers than Outsourcers.²⁶²² The Commission further

²⁶¹⁹ SIFMA Letter at 7.

²⁶²⁰ See Notice, *supra* note 5, at 30727–28.

²⁶²¹ As discussed in the Notice, the Insourcing/Outsourcing decision is correlated with firm size. Insourcers tend to be larger firms, as do ELPs and Options Market Makers. These firms are likely to have more internal systems and more complex internal systems that will likely be more expensive to retire. On the other hand, Outsourcers, new reporters and options floor brokers are likely to be smaller firms with fewer internal systems that are less complex for retirement. Furthermore, new reporters and options floor brokers are likely to have fewer internal reporting systems than other broker-dealers because they are unlikely to have current OATS reporting obligations. *Id.* at 30718.

²⁶²² The Commission recognizes that there is uncertainty in the system retirement costs that broker-dealers will face generally. The estimates provided by the commenter are presented as a range, and the Commission's assumptions of which firms would fall at the top and the bottom of the range have significant uncertainty. If all 1,800 broker-dealers anticipated to incur CAT reporting obligations bore \$100,000 in system retirement costs, broker-dealer system retirement costs would be \$180 million. The Commission believes

assumes that non-OATS reporting firms that were considered small for cost estimates (new small firms and options floor brokers) will face similar system retirement costs to Outsourcers because they are more similar in size and scope of operations to Outsourcers than Insourcers.²⁶²³ With these assumptions, the Commission now estimates that broker-dealer system retirement costs would be \$33.4 million, as described in Table 6. The Commission draws its estimates of system retirement costs for Participants and service providers from the Plan, which estimates aggregate costs of \$343,000²⁶²⁴ across all Participants, and \$21.3 million across all service providers. The Commission now estimates total industry costs for system retirement will be \$55 million.

system retirement costs will be far less than this because many broker-dealers currently have limited regulatory data reporting systems, and the majority of broker-dealers rely on service providers to perform much of their data reporting responsibilities.

²⁶²³ The Commission recognizes that some new reporters and options floor brokers may choose to insource their CAT reporting activities, and thus may be considered similar in size and scope of operations to non-OATS reporting large firms. Because new reporters and options floor brokers do not currently report to OATS, the Commission believes that they will face lower system retirement costs than ELPs and Options Market Makers because the Commission believes many ELPs and Options Market Makers are members of an exchange that requires them to be able to report to OATS on request, while new small firms and options floor brokers are unlikely to be members of an exchange with this requirement.

²⁶²⁴ The Notice estimated \$310,000 for system retirement costs for Participants. The Commission is increasing this estimate by 10.53% to account for the addition of two Participants. See Section V.F.1.b, supra.

Table 6: Estimate of System Retirement Costs

	Number	CAT System Retirement
Central Repository		
Participants (all)		\$342,632
Service Bureaus (all, 13)		\$21,300,000
Broker-Dealers:		
Insourcers	126	\$12,600,000
Outsourcers	806	\$8,060,000
New Small Firms	799	\$7,990,000
ELPs	14	\$1,400,000
Options Market Makers	31	\$3,100,000
Options Floor Brokers	24	<u>\$240,000</u>
Total BD	1800	\$33,390,000
Total Industry		\$55,032,632

3. Further Analysis of Costs

a. Costs Included in the Estimation

In the Notice, the Commission noted that, in general, the CAT NMS Plan does not break down its cost estimates as a function of particular CAT NMS Plan requirements. However, the Commission considered which elements of the CAT NMS Plan were likely to be among the most significant contributors to the estimated CAT costs.²⁶²⁵ The Commission discussed its preliminary belief that significant sources of costs would include: the requirement to report customer information;²⁶²⁶ the requirement to report certain information as part of the Material

²⁶²⁵ See Notice, supra note 5, at 30730–32.

²⁶²⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section A.1.a.iii.

Terms of the Order; the requirement to use listing exchange symbology; and the inclusion of Allocation Reports.

In addition, the Commission discussed its preliminary belief that while certain costs could generally be quantifiably estimated, they were unlikely to be significant contributors to the overall costs of the Plan. These factors included: clock synchronization requirements; Plan requirements that include the requirement that Options Market Makers send quote times to the exchanges; the requirement that the Central Repository maintain six years of CAT Data; and the inclusion of OTC Equity Securities in the initial phase of the implementation of the CAT NMS Plan. Furthermore, the Commission also explained that there were other sources of costs, namely costs associated with meeting certain targets such as error rates and management of PII, that could not be quantified by the Commission.

The Commission noted that it believed that its estimates of the implementation costs and ongoing costs to industry included each of the costs discussed, because the provisions encapsulate major parts of the Plan. The Commission explained that it lacked the necessary information to estimate what portion of the costs of the Plan is attributable to some of these aforementioned elements because the Plan does not provide information on the costs attributable to reporting of this information, and the Commission had no other data from which it can independently estimate these costs.

As discussed more fully below, the Commission has considered the comments it received regarding its analysis of these aforementioned costs, the Participants' response, and modifications to the Plan, and is updating its analysis in three ways. First, the Commission's analysis fully acknowledges the uncertainty in its cost estimates. Second, several comments disagreed with the Commission's belief that certain costs were included in the Commission's

cost estimates. The Commission has analyzed each of these instances below and now believes that some costs, namely costs associated with Allocation Time and Quote Sent Time, were not included in the estimated costs in the Notice. As indicated in the Costs to Broker-Dealers, Costs to Participants, and the Costs of Building and Operating the Central Repository Sections above, the Commission has added these costs to the total costs for broker-dealers where estimates are available or otherwise recognizes them as additional to the existing estimates.²⁶²⁷ Third, several commenters disagreed with which costs the Commission noted as significant contributors to CAT costs. In response to comments, the Commission no longer judges whether quantified costs represent a significant contribution to total costs. Instead, it describes only the costs it cannot quantify in terms of whether the Commission believes such costs are a substantial proportion of costs of the CAT NMS Plan, and addresses those individually below. The Commission is cognizant that some of the costs for particular elements may be significant in isolation even if they are not a large proportion of the aggregate costs of the Plan. The following Sections expand on the analysis of the estimated costs above by exploring individual components of the CAT NMS Plan.

(1) Customer Information

In the Notice, the Commission discussed its belief that the requirement in the CAT NMS Plan to report customer information for each transaction represents a significant source of

²⁶²⁷ The Commission recognizes that Allocation Time may also increase the costs of the Central Repository and that Quote Sent Time may increase the costs of the Central Repository and to Participants. However, the Commission lacks sufficient information to add these costs to the existing estimates in these categories. Consequently, the Commission discusses the modifications qualitatively.

costs.²⁶²⁸ The Commission explained that adapting systems to report customer information that is not included in current regulatory data on a routine basis could require significant and potentially difficult reprogramming because it could require gathering information from separate systems within a broker-dealer's infrastructure and consolidating it in one location, and redesigning an IT infrastructure to satisfy this requirement could interrupt other workflows within the broker-dealer, expanding the scope of systems that must be altered to accomplish CAT reporting.

The Commission received comments regarding the costs associated with reporting customer information. One commenter mentioned that the costs for providing customer information to the Central Repository represent a significant proportion of costs to the total industry.²⁶²⁹ One commenter requested clarification that only active accounts are reported as part of the customer definition process, and as a result of such clarification, this could reduce costs incurred for reporting customer information.²⁶³⁰ Two commenters stated that including Customer Identifying Information on the Initial Order Report would result in significant costs for the industry.²⁶³¹

The Participants responded to the comment regarding clarification of reporting only active accounts, stating that they have proposed to add a definition of "Active Account", defined as an account that has had activity in Eligible Securities within the last six months. Additionally, the Participants propose amending Section 6.4(d)(iv) of the Plan to clarify that each Industry

²⁶²⁸ See Notice, supra note 5, at 30730.

²⁶²⁹ Data Boiler Letter at 37.

²⁶³⁰ FIF Letter at 10.

²⁶³¹ TR Letter at 8–9; FIF Letter at 9–10, 86.

Member must submit an initial set of customer information for Active Accounts at the commencement of reporting to the Central Repository, as well as any updates, additions, or other changes in customer information, including any such customer information for any new Active Accounts.²⁶³² In response to the comments regarding the expense associated with reporting Customer Identifying Information in the Initial Order Report, the Participants recommended modifications to the Plan to clarify that Customer Identifying Information and Customer Account Information does not need to be included on the Initial Order Report.²⁶³³

The Commission considered these comments, the Participants' response and modifications to the Plan, and continues to believe that the requirement in the CAT NMS Plan to report customer information represents a significant proportion of total costs to the industry. No commenter provided cost estimates that would allow the Commission to estimate the costs, however. Further, the economic analysis did not explicitly account for Customer Identifying Information and Customer Account Information on the Initial Order Report, and the modification clarifies that the Plan does not require this information on order origination.

(2) Material Terms of the Order

In the Notice, the Commission preliminarily explained that the requirement to report Material Terms of the Order that include an open/close indicator for equities, order display information, and special handling instructions represent a significant source of cost. The Commission observed that not all broker-dealers are required to report these elements on every order and no market participants report an open/close indicator on orders to buy or sell equities. Thus, adapting some market participants' systems to report this information for each transaction

²⁶³² Response Letter I at 35.

²⁶³³ Response Letter I at 34.

could require significant and potentially difficult reprogramming that requires centralizing or copying information from multiple IT systems within the broker-dealer, which could dramatically increase the costs associated with implementing the changes required by CAT.

The Commission received comments on the costs of the open/close indicator, but did not receive comments on other components of the Material Terms of the Order. Three commenters agreed with the Commission’s analysis that an open/close indicator represents a significant proportion of costs of the Plan.²⁶³⁴ Two commenters indicated that it would require significant process changes across multiple systems,²⁶³⁵ and one provided a list of the different types of systems impacted by the open/close indicator.²⁶³⁶ Three commenters mentioned that currently, the open/close indicator is not populated for equities.²⁶³⁷ One of these commenters mentioned the inclusion of the open/close indicator for equities represents a “market structure change.”²⁶³⁸ Further, several commenters implied that the costs of the open/close indicator were not included in the cost estimates in the Notice.²⁶³⁹ The Participants did not directly address the costs of the open/close indicator but did indicate that it is currently only captured on certain options orders, implying that including this field in the Plan would be costly.²⁶⁴⁰ In particular, the Participants’

²⁶³⁴ TR Letter at 9; SIFMA Letter at 35–36; FIF Letter at 83–86.

²⁶³⁵ SIFMA Letter at 35; FIF Letter at 4, 84.

²⁶³⁶ FIF Letter at 84.

²⁶³⁷ TR Letter at 9, FIF Letter at 4, SIFMA Letter at 35.

²⁶³⁸ FIF Letter at 85; TR Letter at 9.

²⁶³⁹ Specifically, one commenter stated that the inclusion of the open/close indicator for equities was a surprise (See FIF Letter at 84) and two commenters wanted additional cost benefit analysis on the open/close indicator (See FIF Letter at 84; SIFMA Letter at 36).

²⁶⁴⁰ Response Letter I at 21, 22.

response indicates that the open/close indicator is not captured on equities or on certain options transactions such as Options' Market Maker transactions.

The Commission considered these comments, the Participants' response, and modifications to the Plan and is updating and revising its economic analysis regarding the costs of the open/close indicator for equities and certain options transactions below.

The modifications to the Plan eliminating the requirement to report an open/close indicator for equities will reduce the compliance costs for broker-dealers, Participants, and the Central Repository, but the Commission cannot quantify the savings. While several commenters implied that the cost estimates in the Notice did not account for the open/close indicator in equities, the Commission notes that this data field was proposed in Rule 613 and discussed in the Proposing Release and Notice. Nonetheless, the commenters represent many broker-dealers and, therefore, the comments may indicate that a number of broker-dealers indeed did not include these costs when responding to the cost survey. This raises uncertainty regarding how many broker-dealers did or did not account for these costs. Because of this uncertainty and the absence of comments detailing the costs, the Commission cannot update its cost estimates to recognize the Plan modifications. However, both the Commission and commenters agree that, absent a modification, market participants would have needed to adapt their systems to report open/close information for each order because this indicator is not populated for equities today.

The Participants' statement in the response letter that open/close indicators are not reported on some options orders is consistent with Commission experience and the analysis in the Notice. While the economic analysis in the Notice did not explicitly separate the costs associated with an open/close indicator for equities and an open/close indicator for options, the Commission continues to believe that the costs of the open/close indicator for options are

included in the cost estimates above because the commenters who implied that the cost estimates do not include estimates of the open/close indicator specifically mentioned equities and not options. But because the Plan will no longer require the reporting of the open/close indicator for Options Market Maker transactions, the Commission now believes there will be additional cost savings associated with not having to report this indicator as part of CAT.

(3) Listing Exchange Symbology

In the Notice, the Commission explained its preliminary belief that the requirement to use listing exchange symbology could represent a significant source of costs.²⁶⁴¹ The Commission explained that because broker-dealers do not necessarily use listing exchange symbology when placing orders on other exchanges or off-exchange, this requirement could require broker-dealers to perform a translation process on their data before they submit CAT Data to the Central Repository.²⁶⁴² The translation process could be costly to design and perform, and result in errors that would be costly for the broker-dealers to correct. If other elements of the Plan were to necessitate a translation, then the listing exchange symbology could be fairly low cost because it would be just another step in the translation. However, if the Plan has no other requirement that would necessitate a translation, the Commission explained that the costs of including listing exchange symbology on all CAT reports would include the costs of designing and performing the translation as well as the costs of correcting any errors caused by the translation.

²⁶⁴¹ See Notice, supra note 5, at 30730–30731.

²⁶⁴² For example, class A shares of ABC Company might be traded using ticker symbol “ABC A” on one exchange, “ABC_A” on another exchange, and “ABC.A” on a third. As written, the Plan would require all broker-dealers to use the listing exchange’s symbol for its Central Repository reporting, regardless of the symbol in the order messages received or acted upon at the broker-dealer or exchange.

The Commission received several comments regarding costs associated with CAT Reporters using listing exchange symbology. One commenter stated that they did not expect the use of listing exchange symbology to be much more costly than the use of existing symbology.²⁶⁴³ Another commenter suggested that accepting only listing exchange symbology is costly and invasive.²⁶⁴⁴ One other commenter stated that listing exchange symbology would also be a significant source of costs for options.²⁶⁴⁵

The Participants' response provided information on current practices relevant to the Commission's economic analysis. In particular, the Participants stated that based on discussions with the DAG, it was their understanding that all Industry Members subject to OATS or EBS reporting requirements currently use the symbology of the listing exchange when submitting such reports.²⁶⁴⁶ These Industry Members may use proprietary symbols when recording events internally, but the Participants stated that based on their understanding of current practices, Industry Members currently employ technical solutions and/or systems that allow them to translate symbology into the correct format of the listing exchange when submitting data to exchanges or when submitting to regulatory reporting systems such as OATS or EBS.²⁶⁴⁷

The Commission considered the comments and the Participants' response and is revising its analysis and conclusion. Specifically, the Commission is incorporating the information from the Participants' response into its baseline of current broker-dealer practices. Because the

²⁶⁴³ FIF Letter at 12, 95.

²⁶⁴⁴ Data Boiler Letter at 37–38.

²⁶⁴⁵ Bloomberg Letter at 5.

²⁶⁴⁶ Response Letter II at 7.

²⁶⁴⁷ Response Letter III at 13.

Commission believes that broker-dealers already translate their order messages when routing orders, they should be able to apply those translations to other types of messages before recording the events or reporting them to CAT at a relatively low cost. Therefore, the Commission now believes that the incremental cost for CAT Reporters to translate from their existing symbology to listing exchange symbology would be smaller than as discussed in the Notice and would not be a substantial contributor to aggregate costs. This revised conclusion is consistent with commenters who indicated there would be costs, but did not indicate they would be large and did not provide cost estimates.

(4) Allocation Reports

In the Notice, the Commission recognized that industry would bear certain costs associated with Allocation Reports, particularly the requirement that the reports include allocation times. The Commission understood that currently some broker-dealers already record allocation times, but that the broker-dealers that do not currently record these times will face implementation costs associated with changing their business processes to record them. The Commission explained that implementation costs for allocation reporting may include significant costs associated with incorporating additional systems into firms' regulatory data reporting infrastructure to facilitate this reporting, if such systems would not already be involved in recording or reporting order events. Furthermore, the Commission explained that Outsourcers could face significant implementation and ongoing costs associated with reporting Allocation Reports if their service bureaus do not extend their services to manage the servers that handle allocations.

Three commenters noted that there would be costs associated with reporting allocation timestamps.²⁶⁴⁸ One of these commenters mentioned that the requirement to report allocation timestamps means that industry members would need to incur unnecessary costs to acquire additional resources, and that these resources could be better served implementing other critical requirements of the CAT Plan.²⁶⁴⁹ One commenter also provided cost estimates for reporting allocation timestamps at a granularity of one millisecond, as would be required in the Plan, and at a granularity of one second.²⁶⁵⁰ In particular, the commenter reported that it conducted a survey of a set of broker-dealers to estimate the additional costs of the CAT NMS Plan that would be associated with the timestamp requirement on CAT Allocation Reports. Based on the results of the survey, the commenter estimated that the currently proposed allocation timestamp requirement, with a one millisecond timestamp granularity and a 50 millisecond clock offset, would cost the industry \$88,775,000 in initial implementation costs and \$13,925,000 in ongoing annual costs. The commenter further estimated that a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset, would cost the industry \$44,050,000 in initial implementation costs and \$5,035,833 in ongoing annual costs.²⁶⁵¹ The commenter also indicated that neither the survey of broker-dealers used to estimate the cost estimates in the Plan nor the survey used to estimate the costs of clock synchronization requirements included the requirement of timestamps on Allocation Reports.²⁶⁵²

²⁶⁴⁸ FSR Letter at 9; SIFMA Letter at 35; FIF Letter at 3–4, 11, 86–89.

²⁶⁴⁹ FSR Letter at 11.

²⁶⁵⁰ FIF Letter at 87–89.

²⁶⁵¹ FIF Letter at 88, Table 6.

²⁶⁵² FIF Letter at 86.

The Participants' response recommended a modification to the Plan that would specify a one-second timestamp for allocation time on Allocation Reports,²⁶⁵³ and the Plan has been amended to reflect this recommendation.

The Commission considered these comments, the Participants' response, and modifications to the Plan and is updating its analysis stated in the Notice. The comments that acknowledged that providing allocation timestamps represents a significant proportion of costs of the Plan are consistent with the Commission's analysis in the Notice. The Commission has analyzed the cost estimates received and believes them to be reliable because they are based on a survey of industry participants who are informed of the Allocation Time requirement and the changes that broker-dealers would need to make to comply with the requirement. Further, the Commission has analyzed the public information on the dates of the CAT Reporter survey and the release of public information on the inclusion of Allocation Time. In recognition of the modification to the timestamp granularity and the realization that Allocation Time costs were not included in the cost estimates in the Notice, the Commission is now adding the commenter's estimate of \$44,050,000 in implementation costs and \$5,035,833 in ongoing costs to the estimates of costs to broker-dealers.²⁶⁵⁴

(5) Clock Synchronization

In the Notice, the Commission discussed its preliminary belief that the clock synchronization requirements represented a less significant source of costs. The CAT NMS Plan estimated industry costs associated with the original 50 millisecond clock synchronization

²⁶⁵³ Response Letter I at 25.

²⁶⁵⁴ See Section V.F.3.a(4), *supra*. The total cost estimates of the CAT Plan reflect these implementation and ongoing costs.

requirement, based on the FIF Clock Offset Survey.²⁶⁵⁵ The FIF Clock Offset Survey stated that broker-dealers currently spend \$203,846 per year on clock synchronization activities, including documenting clock synchronization events.²⁶⁵⁶ The FIF Clock Offset Survey stated that firms expected the proposed 50 millisecond requirement to increase those costs by \$109,197 per firm.²⁶⁵⁷ Based on discussions with industry, the Commission preliminarily believed that the majority of broker-dealers (Outsourcers) would not face significant direct costs for clock synchronization because timestamps for CAT Data reporting would be applied by service bureaus.²⁶⁵⁸ However, the Commission preliminarily estimated there are 171 firms that make the insourcing-outsourcing decision on a discretionary basis;²⁶⁵⁹ if these firms decided to insource

²⁶⁵⁵ See CAT NMS Plan, supra note 5, at Section D.12, and note 247. In the Notice, the Commission noted that the survey has two limitations pertinent to specific cost estimates provided in the summary of survey results. First, cost estimates are likely to be significantly downward biased. Individual responses to cost data were gathered within a range; for example, a firm would quantify its expected costs as “Between \$500K and less than \$1M” or “\$2.5M and over.” When aggregating these responses, FIF generally used the range midpoint as a point estimate; however, for the highest response, the range minimum was used (*i.e.*, “\$2.5M and over” was summarized as \$2.5M.) This is likely to have produced a significant downward bias in aggregate survey responses. Second, the survey included only broker-dealers and service bureaus, thus the data excludes exchanges. The Commission preliminarily believed this limitation would not significantly impact industry costs because all exchanges currently maintain clock synchronization standards finer than those discussed as alternatives.

²⁶⁵⁶ See FIF Clock Offset Survey, supra note 247. This is based on the current practice of the broker-dealers who responded to the survey.

²⁶⁵⁷ See id. at 16. The \$109,197 figure is obtained by subtracting the cost of maintaining current clock offsets of \$203,846 annually from the estimated per-firm annual cost of maintaining a 50-millisecond clock offset of \$313,043. See id. at 7 (“Even where firms were at the target clock offset, many firms cited additional costs associated with compliance including logging and achieving greater degrees of reliability”).

²⁶⁵⁸ See Section V.F.1.d, infra, for discussion of service bureau costs and the degree to which those costs might be passed on to broker-dealers.

²⁶⁵⁹ These are the 126 current OATS reporters that report more than 350,000 OATS ROEs per month; the 31 options market-making firms; and the 14 ELPs.

their data reporting under CAT, they would likely face costs associated with complying with new clock synchronization requirements. The Commission preliminarily estimated that industry-wide implementation costs for the 50 millisecond clock synchronization requirement would be \$268 million, with \$25 million annually in ongoing costs.²⁶⁶⁰ The Commission preliminarily believed that approximately \$18.7 million in broker-dealer ongoing costs would be attributable to clock synchronization requirements.²⁶⁶¹ The Commission also preliminarily believed that service bureaus would face similar clock synchronization costs if the CAT NMS Plan is approved. Using 13 as an estimate of the number of service bureaus, approximately \$6 million in service bureau ongoing costs would be attributable to clock synchronization requirements in the Plan.²⁶⁶²

²⁶⁶⁰ See Section VI.H.2.a(1), *infra*, for a discussion of how these implementation costs might vary for different clock synchronization standards.

²⁶⁶¹ See *id.*, for discussion of costs attributable to the 50 millisecond clock synchronization tolerance proposed in the Plan, including the \$109,197 estimate of per-firm implementation costs of the 50 millisecond clock synchronization requirement; see also CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(i)(A)(3). 171 broker-dealers x \$109,197 = \$18,672,687. Note also that the Commission erroneously reported in the Notice that costs were \$19.7 million in implementation costs, but these estimated costs should have been \$18.7 million in ongoing costs. See Notice, *supra* note 5, at 30762–63 for further information on the Commission’s estimation.

²⁶⁶² The CAT NMS Plan states that the Vendor Study was distributed to 13 service bureaus or technology-providing firms identified by the DAG. See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(i)(A)(3). 13 service bureaus x \$109,197 x 4.2 = \$5,962,156.2. The 4.2 multiplier is the ratio between the total incremental ongoing charges to broker-dealers and the total incremental ongoing costs to service bureaus derived from the cost estimates above. See Notice, *supra* note 5, at 30763 n 1245. Note that the Commission erroneously reported in the Notice that costs were \$1.4 million in implementation costs, but these estimated costs should have been \$6 million in ongoing costs. The Commission believed clock synchronization costs are already included in cost estimates provided in the Vendor Study. In the Notice, the Commission explained its belief that these costs likely would ultimately be passed on to service bureaus’ broker-dealer clients. See Notice, *supra* note 5 at 30726; see also Notice, *supra* note 5, at 30762–63 for further information on the Commission’s estimation.

In addition, the Commission solicited comment in the Notice on alternatives to the Plan’s one-size-fits all definition of “industry standard.”²⁶⁶³ Under these alternatives, “industry standard” would be defined in terms of the standard practices of different segments of the CAT Reporters. The Commission explained that these alternative approaches could result in clock offset tolerances shorter than the CAT NMS Plan’s proposed 50 millisecond standard for some or all CAT Reporters. Using information from a survey,²⁶⁶⁴ the Commission estimated broker-dealer costs under various alternative standards.

The Commission received several comments regarding costs associated with clock synchronization requirements. One commenter mentioned that managing multiple clock synchronization structures across report types would present unnecessary difficulties for broker-dealers and unnecessary reconciliation issues for the Commission and SROs.²⁶⁶⁵ Another commenter stated that clock synchronization will cost the industry \$268 million for initial implementation of a 50 millisecond clock offset and \$25 million for annual monitoring/maintenance, and that this represents a significant proportion of overall industry costs of the CAT NMS Plan.²⁶⁶⁶ Furthermore, as discussed in Section V.F.3.a.(4), the commenter also indicated that the survey of broker-dealers used to estimate the costs of clock synchronization requirements did not include the requirement of timestamps on Allocation Reports.²⁶⁶⁷ The commenter estimated that the proposed allocation timestamp requirement would cost the

²⁶⁶³ See Notice, supra note 5, at 30759.

²⁶⁶⁴ See FIF Clock Offset Survey, supra note 247.

²⁶⁶⁵ SIFMA Letter at 34.

²⁶⁶⁶ FIF Letter at 108.

²⁶⁶⁷ FIF Letter at 86.

industry \$88,775,000 in initial implementation costs and \$13,925,000 in ongoing annual costs and that a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset, would cost the industry \$44,050,000 in initial implementation costs and \$5,035,833 in ongoing annual costs.²⁶⁶⁸ Finally, this commenter highlighted several limitations in the Commission’s cost estimates that result in these estimates understating industry cost.²⁶⁶⁹ First, the commenter said that the costs in the FIF survey do not represent “insourcer” implementation costs as the Commission assumed because the survey was skewed toward smaller broker-dealers. Second, the commenter said that the Commission stated that the FIF Clock Offset Survey underestimated the costs per firm because of the methodology used to select a “midpoint” for the top cost range. Finally, the commenter said that the Commission should not have assumed staffing of ¼ full time employee (“FTE”) for initial implementation because it is incorrect to assume that all of the costs would be borne by a service bureau for all broker-dealers.

The Participants’ response recommended a modification to the Plan changing the clock synchronization to 100 microseconds with regards to electronic systems, excluding certain manual systems; but stated that having multiple clock synchronization standards across an order lifecycle would complicate the linking process at the Central Repository, implying an increase in costs.²⁶⁷⁰ In addition, the Participants’ response recommended a modification to the Plan that would specify a one-second timestamp for allocation time on Allocation Reports²⁶⁷¹ and that would permit Industry Members to synchronize their Business Clocks used solely for reporting

²⁶⁶⁸ FIF Letter at 88, Table 6.

²⁶⁶⁹ Id. at 109.

²⁶⁷⁰ Response Letter II at 5.

²⁶⁷¹ Response Letter I at 25.

the time of allocation on Allocation Reports to within one second.²⁶⁷² The Plan has been amended to reflect each of these recommendations. The Commission is also amending the Plan to state that the Participants should apply industry standards based on the type of CAT Reporter or system, rather than the industry as a whole.²⁶⁷³

The Commission has considered the comments received, the Participants' response, and modifications to the Plan regarding clock synchronization and is revising its analysis of the costs attributable to this element of the Plan. In response to the commenter that stated the Commission's estimate for clock synchronization costs represents a significant portion of overall costs, the Commission did not intend to imply in the Notice that the magnitude of the clock synchronization costs were trivial, but instead that these costs were less significant contributors to overall costs than other costs.

In response to the commenter that stated the Commission's cost estimates associated with clock synchronization requirements were understated, the Commission recognizes the limitations in its analysis. However, the Commission lacks sufficient information to derive a more precise estimate. Although the participants in the FIF Clock Offset Survey²⁶⁷⁴ were skewed towards smaller firms that did not match the "insourcer" model, as the commenter mentioned, it is unclear that the inclusion of such firms would bias the Commission's cost estimates downward. Also, the Commission's estimate of ¼ FTE for the clock synchronization implementation costs for Outsourcers is in line with its estimate of 1 FTE for the overall implementation costs for Outsourcers whereas multiplying the estimate from the survey results by the number of

²⁶⁷² Response Letter III at 14.

²⁶⁷³ See CAT NMS Plan, supra note 5, at Section 6.8(c).

²⁶⁷⁴ See FIF Clock Offset Survey, supra note 247.

Outsourcers would yield a result that would be approximately 87% of the Commission's estimates for total implementation costs for outsourcers.²⁶⁷⁵ The Commission agrees, however, that the average cost calculated in the FIF Clock Offset Survey included an inherent downward bias due to the selection of the minimum value in the highest cost response range when calculating the average.²⁶⁷⁶ In conclusion, while the Commission recognizes a degree of uncertainty in its clock synchronization cost estimates, which may be downward biased, the commenter does not offer an alternative cost estimate, and the Commission does not have enough information to change its estimate.

The Commission agrees with the commenter that stated cost estimates in the Plan did not include the requirement of timestamps on Allocation Reports. In recognition of the modification to the Plan regarding timestamp requirements of Allocation Reports, and in realization that Allocation Time costs were not included in the cost estimates in the Notice, the Commission is now adding the commenter's estimate of \$44,050,000 in implementation costs and \$5,035,833 in ongoing costs for the inclusion of timestamps on Allocation Reports to the estimated costs of broker-dealers.²⁶⁷⁷

The Commission is unable to update cost estimates to account for the modifications to the clock synchronization standards for exchanges, but the Commission does not believe that the modifications will result in substantial cost increases for exchanges. The Commission does not

²⁶⁷⁵ Compare the implied Outsourcer clock offset implementation cost estimate of $\$554,348 \times 1,629 = \$903,032,892$ ($\$554,348 \times 1,629$ outsourcers) to total Outsourcer implementation costs of \$1,040,506,000 ($342,026,000 + 678,111,000 + 20,369,000$). See Notice, supra note 5, at 30726.

²⁶⁷⁶ See Notice, supra note 5, at n 968.

²⁶⁷⁷ The total cost estimates of the CAT Plan reflect these implementation and ongoing costs. See Section V,F.2.a, infra.

have sufficient information to estimate clock synchronization costs for exchanges. However, based on information cited in the Notice²⁶⁷⁸ and the Participants' response,²⁶⁷⁹ the Commission understands that exchanges already maintain clock offsets of 100 microseconds or less. While the Commission recognizes that exchanges may still incur costs in additional logging and other actions to ensure they maintain clock offsets in compliance with the Plan, the Commission does not believe these additional costs will be substantial.

The Commission does not agree with the Participants that having multiple clock synchronization standards within the same order lifecycle will complicate the linkage process at the Central Repository. As indicated in Section V.D.2.b.(2), the industry already operates with multiple clock synchronization standards. Therefore, regardless of whether the clock synchronization standards apply a one-size-fits-all definition of industry standard or apply a different standard to exchanges, the linking process is already complicated by the fact that exchanges and many broker-dealers already synchronize some or all of their business systems to less than 50 milliseconds. The Commission therefore believes that the modifications to the Plan to set the clock synchronization standard for exchanges at 100 microseconds and base industry standards on the type of CAT Reporter or system will not increase the costs of the Central Repository.

The Commission acknowledges that the requirement for the Participants to perform an assessment of clock synchronization standards, including consideration of industry standards based on the type of CAT Reporter, Industry Member and type of system, will impose additional

²⁶⁷⁸ See Notice, supra note 5, at 30669.

²⁶⁷⁹ Response Letter II at 4.

costs on the Participants.²⁶⁸⁰ Furthermore, it is possible that the requirement to base industry standards on the type of CAT Reporter or system will ultimately lead to additional costs from more granular clock synchronization standards for some Industry Members in the future. However, any resulting proposed amendments to the Plan regarding clock synchronization standards would be subject to notice and comment.²⁶⁸¹

(6) Quote Sent Time and OTC Equity Securities

In the Notice, the Commission stated its preliminary belief that other Plan requirements such as the requirement that Options Market Makers report Quote Sent Time to the exchanges would cost between \$36.9 million and \$76.8 million over five years;²⁶⁸² and the requirement to maintain six years of data at the Central Repository would cost approximately \$5.59 million.²⁶⁸³ The cost to include OTC Equity Securities in the initial phase of the implementation of the Plan could not be estimated.²⁶⁸⁴ The Commission preliminarily concluded that these requirements did not represent a significant source of costs.

²⁶⁸⁰ See Section V.F.1.b, *supra*.

²⁶⁸¹ See Notice, *supra* note 5, at 30759–64.

²⁶⁸² See FIF, SIFMA, and Security Traders Association, Cost Survey Report on CAT Reporting of Options Quotes by Market Makers (November 5, 2013), available at <http://www.catnmsplan.com/industryfeedback/p601771.pdf>; see also CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iv)(B).

²⁶⁸³ See CAT NMS Plan, *supra* note 5, at Section 12(m).

²⁶⁸⁴ See *id.* at Section 12(q). The Commission does not have the information necessary to precisely estimate the costs that are incurred by including OTC Equity Securities in the initial phase of the implementation of the CAT NMS Plan, because the Plan does not separately present the costs associated with OTC Equity Securities. Because of low trading activity in the OTC equity markets, any significant costs associated with including OTC Equity Securities would be in implementation costs. Further, broker-dealers that implement CAT Data reporting for NMS securities may not incur significant additional costs to implement CAT Data reporting for OTC Equity Securities.

The Commission received a comment regarding the costs incurred by Option Market Makers regarding reporting Quote Sent Times. According to the FIF/SIFMA/STA Cost Survey Report on CAT Reporting of Options Quotes by Market Makers, the estimated 5-year cost to Options Market Makers for adding a timestamp to the quote times was between “\$39.9” million and \$76.8 million.²⁶⁸⁵ The commenter further stated that this is “not a trivial cost for providing one data element to the consolidated audit trail.”²⁶⁸⁶ The Commission did not receive any comments on the requirement to retain an extra year of data in the Central Repository and the inclusion of OTC Equity Securities in the initial implementation phase of CAT. Furthermore, the issues were not addressed in the Participants’ response and there were no changes in the Plan that would affect the Commission’s conclusions.

As such, in light of the comments received, the Commission continues to believe that the estimates in the Notice are reliable estimates for the costs for Option Market Makers to send the Quote Sent Time field to exchanges. In response to the comment that the five year costs of adding a timestamp to the quotes is not trivial, the Commission notes that the implied annual costs would be much lower than the five year costs and the Commission agrees that the costs of quote sent time are large. The Commission is no longer referring to quantified costs as significant or less significant contributors to overall costs.

As noted above, in response to comments, the Commission acknowledges that the Allocation Time data field was not included in its cost estimates in the Notice.²⁶⁸⁷ For similar reasons, the Commission now also believes that the Quote Sent Time is also not included in the

²⁶⁸⁵ FIF Letter at 65.

²⁶⁸⁶ FIF Letter at 65.

²⁶⁸⁷ See Notice, supra note 5, at Section IV.F.1.c(2).

cost estimates in the Notice. Therefore, the Commission now adds these costs to the total costs to be incurred by broker-dealers.²⁶⁸⁸ The Commission recognizes that Participants and the Central Repository will also incur costs to comply with the Quote Sent Time requirements; however the Commission lacks sufficient information to quantify these costs, and therefore, does not add them to the cost estimates above for Participants or the Central Repository.

The Commission also recognizes that the modifications to the Plan to require the submission of the LEI for Customers, if an Industry Member has or acquires its Customer's LEI, and the LEI for Industry Members, if the Industry Member has one, could be an additional source of costs for broker-dealers. The Commission however does not believe that these costs will be substantial, because the Plan does not require Industry Members or others to obtain or submit an LEI if they do not already have an LEI.

(7) Other Costs

In the Notice, the Commission stated its preliminary belief that there were other categories of costs in addition to the items discussed above, but that these categories were unlikely to represent significant contributions to the overall costs of the Plan. For example, in addition to providing CAT Reporters data on their Error Rates, the Plan stated that the Participants believed that in order to meet Error Rate targets, industry would require certain resources, including a stand-alone testing environment, and time to test their reporting systems and infrastructure. There were also likely to be costs related to the Plan Processor's management

²⁶⁸⁸ See Section V.F.1.c.(2).B, supra.

of PII,²⁶⁸⁹ as well as related compliance costs associated with minimizing the costs and risks of a security breach.

The Commission received a comment stating that the costs associated with the management of the PII included in the customer information reported could increase the costs of the CAT Plan.²⁶⁹⁰ Another commenter mentioned that underlying customer data is PII information and moving this sensitive data requires extreme precaution, which could also increase these costs.²⁶⁹¹

The Commission considered these comments, as well as modifications to the Plan's security provisions, and is updating its analysis. While the Commission cannot quantify these costs, the Commission believes that costs associated with the management of PII, and related security costs associated with minimizing the costs and risks of a security breach, would increase in light of modifications to the Plan discussed above.²⁶⁹² Specifically, the Commission believes the costs would increase in light of the requirement that the Plan Processor adhere to the NIST Cyber Security Framework in its entirety, the requirement that the CAT System be AICPA SOC 2 certified and audited by a qualified third-party auditor, the requirement that all CAT Data be encrypted, and the requirement that Customer Identifying Information and Customer Account

²⁶⁸⁹ The Commission also acknowledges that the costs associated with handling PII could create an incentive for service bureaus not to offer CAT Reporting services. Nonetheless, the Commission does not believe that this incentive would significantly alter the services available to broker-dealers. For further discussion, see Section V.G.1.e, infra. The Commission also notes that, pursuant to the exemptive relief granted by the Commission, the approach to the reporting of Customer information in the CAT NMS Plan could allow for the bifurcation of PII reporting from the reporting of order data. See Exemption Order, supra note 21, at 11858–63.

²⁶⁹⁰ Data Boiler Letter at 37.

²⁶⁹¹ TR Letter at 8–9; FIF Letter at 9–10, 86.

²⁶⁹² See Section IV.D.6, supra.

Information, irrespective of whether it meets a common understanding of the definition of PII, should be considered PII for security purposes. The Commission believes these costs would represent a significant proportion of the total costs of the CAT Plan.

As discussed above,²⁶⁹³ the Participants' response provided clarifying information on error correction timelines for customer information and PII, and identified an errant discussion of these error correction timelines in the Plan. The Commission is amending the Plan to incorporate the Participants' clarification. The Commission does not believe the clarification regarding the timeline for communication of errors for customer and account information would warrant any changes to its analysis and conclusions regarding costs.

The Commission is also amending the Plan require that the CAT testing environment will be made available to Industry Members on a voluntary basis no later than six months prior to when Industry Members are required to report and that more coordinated, structured testing of the CAT System will begin no later than three months prior to when Industry Members are required to report data to CAT.²⁶⁹⁴ These amendments could increase the costs of the Plan as they relate to the provision of a testing environment.

b. Fees

In the Notice, the Commission discussed a source of costs due to ancillary fees on both broker-dealers reporting to, and regulators accessing, the Central Repository.²⁶⁹⁵ The Commission preliminarily believed that ancillary fees levied on broker-dealers were unlikely to be levied broadly, because discussion in the Plan associated these fees with late and/or inaccurate

²⁶⁹³ See Section V.E.1.d., supra.

²⁶⁹⁴ See Section IV.D.8.a, supra.

²⁶⁹⁵ See CAT NMS Plan, supra note 5, at Section 11.3(c).

reporting. The Plan also discussed ancillary fees possibly levied on regulators associated with the use of Central Repository data. The Commission recognized that costs estimated in Bids for constructing and operating the Central Repository already anticipate use of the CAT Data by regulators, and that additional fees to access the data might give regulators incentives to make less use of the data than anticipated in the Benefits Section. However, any fee schedule proposed by the Participants would be filed with the Commission. Consequently, the Commission preliminarily did not believe that the provisions for ancillary fees would likely significantly impact the costs or benefits of CAT.

Three commenters supported levying fees on regulators that access CAT Data.²⁶⁹⁶ One commenter mentioned that any costs imposed in connection with a usage fee for the CAT will be offset by the costs that the SROs will save in retiring systems. In fact, imposing a user fee could create an incentive to eliminate those systems in a timely fashion.²⁶⁹⁷ While the Participants agreed there are potential benefits to charging a usage fee, they also stated that it is premature to establish such a fee until the Participants gain a better understanding of how the Plan will be used by the regulators and how such usage will impact the operational costs of the Plan.²⁶⁹⁸

The Commission considered these comments, but does not believe that they would warrant changes to the Commission's preliminary analysis and conclusions regarding the ancillary fees under the Plan. Furthermore there were no modifications to the Plan that would warrant changes to this aspect of the economic analysis. The Commission disagrees with the comment that the usage fees would create an incentive for SROs to retire their systems earlier.

²⁶⁹⁶ SIFMA Letter at 18; DAG Letter at 5; STA Letter at 1.

²⁶⁹⁷ SIFMA Letter at 18.

²⁶⁹⁸ Response Letter II at 15.

In fact, the Commission notes that the usage fees could have the opposite effect – it could encourage the SROs to not use CAT for regulatory activities other than surveillance, which could incentivize them to retain these systems longer. The Commission continues to believe that ancillary costs do not represent a significant proportion of costs of the CAT NMS Plan.

4. Expected Costs of Security Breaches

In the Notice, the Commission recognized that investors and market participants could face significant costs if CAT Data security were breached.²⁶⁹⁹ The Commission explained its belief that it is difficult to form reliable economic expectations for the costs of security breaches because there are few examples of security breaches analogous to the type that could occur under the CAT NMS Plan. However, the Commission provided a qualitative analysis of the expected costs of security breaches in the Notice by separating the expected costs of security breaches into two components: the risk of a security breach and the cost resulting from a security breach.²⁷⁰⁰

The Commission acknowledged in the Notice²⁷⁰¹ that because many of the decisions that define security measures for the Central Repository are coincident with the selection of the Plan Processor, there is a degree of uncertainty with regards to security measures that would be implemented by the Plan Processor.²⁷⁰² Consequently, there is uncertainty about the significance

²⁶⁹⁹ See Notice, supra note 5, at 30732–36.

²⁷⁰⁰ See Notice, supra note 5, at Section IV.F.4a(2) for the risk of a security breach and Section IV.F.4a(1) for the costs resulting from a security breach.

²⁷⁰¹ See Notice, supra note 5, at 30733.

²⁷⁰² The Commission noted that, as discussed in the Plan, the Participants collected information from the Bidders regarding security and confidentiality during the RFP process, however, there was considerable diversity in the approaches proposed by the Bidders and the Participants chose to give the Plan Processor flexibility on many implementation details and state the requirements as a set of minimum standards. These requirements include both general security and PII treatment requirements. General

of the risks, the expected costs of a breach when considering the likelihood of a data breach, and the second-order effects.²⁷⁰³

a. Costs of a Security Breach

The Commission discussed its belief in the Notice²⁷⁰⁴ that the form of the direct costs resulting from a security breach will vary across market participants and could be significant. It listed the following four types of costs. First, for broker-dealers, investment advisers, and other similar institutions, a security breach could leak highly-confidential information about trading strategies or positions,²⁷⁰⁵ which could be deleterious for market participants' trading profits and client relationships. Second, a data breach could also expose proprietary information about the existence of a significant business relationship with either a counterparty or client, which could reduce business profits.

Third, a data breach could also potentially reveal PII of customers. Because some of the CAT Data stored in the Central Repository will contain PII such as names, addresses, and social security numbers, a security breach could raise the possibility of identity theft, which currently

security requirements are designed to address physical security, data security during transmissions, transactions, and while at-rest, confidentiality, and a cyber incident response plan. PII requirements include a separate PII-specific workflow, PII-specific authentication and access control, separate storage of PII data, and a full audit trail of PII access. Id.

²⁷⁰³ Id.

²⁷⁰⁴ Id. at 30732.

²⁷⁰⁵ Although the Plan does not require reporting positions, observation of a broker-dealer's recent executions can offer information about their change in position, or, potentially, information about their actual position if the audit trail information breached contains all trading activity since the creation of the position.

costs Americans billions of dollars per year.²⁷⁰⁶ Because PII will be stored in a single, centralized location rather than stored across multiple locations, a breach in the Central Repository could leak all PII, rather than a subset of PII that could be leaked if the information were stored in multiple locations. As such, these costs associated with the risk of a security breach could be substantial in aggregate.

Fourth, a breach that reveals the activities of regulators within the Central Repository, such as data on the queries and processes run on query results, could compromise regulatory efforts or lead to speculation that could falsely harm the reputation of market participants and investors.

The Commission received several comments regarding the costs of a security breach, which are summarized in more detail in Section IV.D.6. Some commenters asserted that the potential costs of a breach exceed those described by the Commission in the Notice because a breach could negatively affect not just individual firms and investors but also the broader financial markets. One commenter wrote that a bad actor gaining access to the Central Repository “may pose tremendous threat to the U.S. financial stability.”²⁷⁰⁷ Another wrote that a breach could be a “threat to market stability or national security” and “would have serious impacts on the global economy.”²⁷⁰⁸ The same commenter stated that “we believe the CAT Data is on par with, and meets, the standards for classified information as set in Executive Order 13526 on Classified National Security Information. . . . We think that unauthorized disclosure or

²⁷⁰⁶ According to survey data, the Bureau of Justice Statistics reported \$24.7 billion in identity theft costs in 2012, available at <http://www.bjs.gov/content/pub/press/vit12pr.cfm>.

²⁷⁰⁷ Data Boiler Letter at 26.

²⁷⁰⁸ MFA Letter at 2, 5.

use of CAT Data could destabilize the U.S. and world financial markets by causing investor panic, mass selling and runs on financial institutions. The potential extent of damage to the U.S. markets and economy would be a matter of national security.” Another commenter cited the Government Accountability Office, stating “the ineffective protection of cyber assets can result in the loss or unauthorized disclosure or alteration of information, [which] could lead to serious consequences and result in substantial harm to individuals and to the federal government.”²⁷⁰⁹

Commenters also asserted that the potential costs of a breach exceed those described by the Commission in the Notice because the Notice did not discuss costs related to breach management. One commenter stated that “the Proposal fails to address who is responsible for the cost of the breach that occurs at the Central Repository,”²⁷¹⁰ and another commenter suggested that “[because] the Plan Processor is responsible for constructing and operating the CAT . . . the Plan Processor should bear responsibility in the event of a data breach.”²⁷¹¹ One commenter wrote that “the cost of complying with the notification requirements under the Privacy Laws may be exorbitant.”²⁷¹² Two commenters recommended the purchase of insurance by the Plan Processor or CAT NMS, LLC to cover the costs of a breach.²⁷¹³ One commenter argued that the Plan Processor must promptly notify a customer of security breaches of his data because “a security breach of a customer’s trading data could compromise the customer’s

²⁷⁰⁹ FSR Letter at 5, which references the “High-Risk Series: An Update” a publication issued by the Government Accountability Office, GAO-15-290 at 235 (Feb. 2015).

²⁷¹⁰ FSR Letter at 7.

²⁷¹¹ FSI Letter at 4.

²⁷¹² FSR Letter at 8.

²⁷¹³ FSR Letter at 8; SIFMA Letter at 22.

investment strategies even if the customer’s PII was not compromised.”²⁷¹⁴ Another commenter observed that breach notification may take longer if the data breach happens at the site of a Participant, “which could greatly harm registered funds and other victims of the breach.”²⁷¹⁵

The Commission acknowledges that the costs of a breach, including breach management, could be quite high, especially during periods of market stress. Furthermore, the Commission understands that a breach could seriously harm not only investors and institutions but also the broader financial markets. The Commission is unable to provide quantitative estimates of those costs because there are few examples of security breaches analogous to the type that could occur under the Plan and because the Plan Processor has some discretion in developing its breach management plan.²⁷¹⁶ The Commission notes, however, that the Plan Processor is responsible for CAT Data,²⁷¹⁷ and it will develop a breach protocol and cyber incident response plan that will include notification of breach victims such as Customers, insurance coverage and liability, and details about the distribution of costs.²⁷¹⁸

b. Risk of a Security Breach

The Commission discussed in the Notice²⁷¹⁹ its belief that the risks of a security breach may not be significant because certain provisions of Rule 613 and the CAT NMS Plan appear reasonably designed to mitigate these risks. However, the Commission noted that the considerable diversity in the potential security approaches of the Bidders creates some

²⁷¹⁴ MFA Letter at 9.

²⁷¹⁵ ICI Letter at 7.

²⁷¹⁶ See CAT NMS Plan, supra note 5, at Appendix D, Section 4.1.5.

²⁷¹⁷ See Section III.26, supra.

²⁷¹⁸ See Section IV.D.6.j, supra.

²⁷¹⁹ See Notice, supra note 5, at 30732–34.

uncertainty about the effectiveness of the eventual security procedures and hence, the risk of a security breach.²⁷²⁰

In the Notice,²⁷²¹ the Commission discussed the provisions of both Rule 613 and the Plan that provide safeguards designed to prevent security breaches.²⁷²² First, governance provisions of the CAT NMS Plan could mitigate the risk of a security breach.²⁷²³ Second, the Plan includes specific provisions designed to ensure the security of data in-flight.²⁷²⁴ Third, Section 6.7(g) of the Plan requires that the Participants establish, maintain, and enforce written policies and procedures reasonably designed to (1) ensure the confidentiality of the CAT Data obtained from the Central Repository; and (2) limit the use of CAT Data obtained from the Central Repository

²⁷²⁰ The Commission notes that, at a minimum, the security of the CAT Data must be consistent with Reg SCI. 17 CFR 242.1000 to 1007.

²⁷²¹ See Notice, supra note 5, at 30733.

²⁷²² The Commission noted that “Rule 613(e)(4) requires policies and procedures that are designed to ensure the rigorous protection of confidential information collected by the Central Repository, and Rule 613(iv) requires that the Plan contain a discussion of the security and confidentiality of the information reported to the Central Repository. Rule 613 also restricts access to use only for regulatory purposes, and requires certain provisions that are designed to mitigate these security risks such as the appointment of a Chief Compliance Officer and annual audits of Plan Processor operating procedures.” Id.

²⁷²³ The Notice, supra note 5, at 30733 lists the following three governance mechanisms: activities of the Compliance Subcommittee that could reduce the risk that information is released to unauthorized entities; the requirement that the Plan Processor submit a comprehensive security plan to the Operating Committee and update this security plan annually; and the establishment of a Chief Information Security Officer who is responsible for monitoring and addressing data security issues for the Plan Processor.

²⁷²⁴ The Commission noted that “the Plan requires that bulk extract data be encrypted, password protected and sent via secure methods of transmission.” Id.

solely for surveillance and regulatory purposes. Finally, the Plan includes further provisions designed to provide security for PII.²⁷²⁵

Commenters made four types of comments about the Notice’s economic analysis of the risk of a security breach. The first type of comment relates to protecting CAT Data that are extracted or downloaded from the Central Repository. Several commenters expressed strong concerns about allowing any entity, including regulators, to extract or download data from the Central Repository because the risk of any data breach would greatly increase as the data are maintained at more sites.²⁷²⁶ One commenter suggested that allowing anyone to download the entire CAT database might threaten U.S. financial stability.²⁷²⁷ Some commenters also objected to excluding the Commission or its Staff from certain security-related parts of the CAT NMS Plan.²⁷²⁸

The second type of comment relates to tailoring security requirements to the security risk of the particular data element. Several commenters argued that at-rest data and in-use data needs to have some of the same security measures that are required for in-flight data in order to keep risk at an acceptable level.²⁷²⁹ Another commenter wrote that maintaining different security

²⁷²⁵ The Commission noted that regulators authorized to access PII would be required to complete additional authentications, and PII would be masked unless users have permissions to view PII. *Id.*

²⁷²⁶ SIFMA Letter at 20; Fidelity Letter at 4; FIF Letter at 134; ICI Letter at 7.

²⁷²⁷ Data Boiler Letter at 26.

²⁷²⁸ FIF Letter at 134; NYSE Letter at 2–4 (noting also that “[i]f employees of the Commission with access to the data stored in the Central Repository or other CAT systems are subject to security standards less stringent than those applicable to other authorized users, the data obtained and held by those individuals may be subject to heightened risk of a data breach”); Garrett Letter at 1–2.

²⁷²⁹ SIFMA Letter at 20; MFA Letter at 8; FSR Letter at 4–8; Data Boiler Letter at 8.

standards for PII data and non-PII data “creates the misimpression that all non-PII data merits less information security protection than PII data” and recommended more accurately matching security requirements to the underlying risk through the imposition of “additional levels of data classification to protect adequately commercially sensitive non-PII data.”²⁷³⁰

The third type of comment relates to the overall risks of the system due to the unique nature of the database. Several commenters suggested that the Commission impose additional security requirements beyond what appears in the Notice because the scale and scope of the Central Repository will make it a particularly attractive target for well-funded hackers, individuals, and nation-states with objectives ranging from theft to insider trading to market disruption.²⁷³¹ Additionally, a number of commenters recommended that the Plan include additional detail concerning the security of CAT Data.²⁷³²

The fourth type of comment relates to data governance. One commenter stated that the proposal for the CCO and CISO to be officers of the Company as well as employees of the Plan Processor creates a conflict of interest that would undermine the ability of these officers to carry out their responsibilities effectively under the Plan because they would owe a fiduciary duty to the Plan Processor rather than the CAT LLC.²⁷³³ The same commenter noted that the Notice did not specify the entity liable in the event of a data breach.²⁷³⁴ The commenter suggested that

²⁷³⁰ ICI Letter at 6.

²⁷³¹ ICI Letter at 3; Fidelity Letter at 3; FSI Letter at 4; SIFMA Letter at 19; MFA Letter at 5.

²⁷³² SIFMA Letter at 20; ICI Letter at 4; FSR Letter at 6; TR Letter at 8; FIF Letter at 131–132; Fidelity Letter at 4. The Commission responds to these comments in detail in Section IV.D.6.a, *supra*.

²⁷³³ FSI Letter at 3. As discussed above in Section IV.D.6, the CCO and CISO each have responsibilities related the security of CAT Data.

²⁷³⁴ FSI Letter at 4–5.

because the Plan Processor is responsible for constructing and operating the CAT, with the oversight of the Operating Committee, and will be solely in control of the system's information security, the Plan Processor should bear responsibility in the event of a data breach.²⁷³⁵

The Participants have responded to these comments. In response to the commenters that expressed concern about allowing any entity to extract or download CAT Data, the Participants noted that Rule 613 requires regulators to develop and implement a surveillance system, or enhance existing surveillance systems to make use of CAT Data.²⁷³⁶ The Participants stated that “eliminating or limiting bulk data extracts of the CAT Data may significantly and adversely impact the Participants’ ability to effectively surveil their markets using CAT Data.”²⁷³⁷ The Participants further noted that the Plan also requires that Participants have appropriate policies and procedures in place to protect all of the CAT Data they extract or download.²⁷³⁸ In response to the comments about excluding the Commission or its Staff from certain security requirements of the Plan, the Participants stated that they agreed that the Plan’s security program must take into consideration all users with access to CAT Data, including the SEC, and they recommended removing the exclusions.²⁷³⁹

In response to the commenter that suggested adding additional levels of data classification, the Participants determined that “it is [not] necessary to expand the categories of

²⁷³⁵ FSI Letter at 4–5.

²⁷³⁶ Response Letter I at 56.

²⁷³⁷ Response Letter III at 10.

²⁷³⁸ Response Letter III at 11.

²⁷³⁹ Response Letter I at 60–61.

other CAT Data.”²⁷⁴⁰ In response to commenters that requested more detail regarding the security controls for CAT Data, the Participants noted that in the Adopting Release for Rule 613, the Commission stated that “an outline or overview description of the policies and procedures that would be implemented under the NMS plan submitted to the Commission for its consideration would be sufficient to satisfy the requirement of the Rule.”²⁷⁴¹ In their response, the Participants also provided additional information about security procedures, including a high level description of the security requirements for the CAT System and additional details concerning certain security controls and protocols required of the Plan Processor.²⁷⁴² The Participants also stated that they believe that “publicly releasing too many details about the data security and information policies and procedures of the CAT System presents its own security concerns and is not advisable.”²⁷⁴³ In response to comments about governance, the Participants agreed that the Plan should explicitly state that the CCO and CISO of the LLC should have fiduciary duties to the LLC in the same manner and extent as an officer of a Delaware corporation and recommended the Plan be amended accordingly.²⁷⁴⁴ Additionally, the Participants stated that they are “in the process of negotiating an agreement with potential Plan Processors. This agreement will cover liability, insurance, and indemnification.”²⁷⁴⁵

The Commission has considered the comment letters and the Participants’ response letters. In response to the commenters that expressed concern about allowing any entity to

²⁷⁴⁰ Response Letter I at 57.

²⁷⁴¹ Response Letter I at 53–54.

²⁷⁴² Response Letter III at 7-8.

²⁷⁴³ Response Letter I at 53–54.

²⁷⁴⁴ Response Letter I at 17–19.

²⁷⁴⁵ Response Letter I at 59.

extract or download CAT Data, the Commission notes that it believes that regulators need access to CAT Data outside the Central Repository to perform their duties effectively. As discussed above in Section IV.D.6.d, Participants that choose to extract or download CAT Data must have policies and procedures regarding CAT Data security that are equivalent to those of the Plan Processor for the Central Repository. And as discussed in Section IV.D.6.o, the rules and policies applicable to the Commission and its Staff will be different yet substantively as rigorous as those applicable to the Participants and their personnel. The Commission therefore believes that, due to these precautions, the regulatory use of CAT Data outside the Central Repository should not increase the security risks to the CAT system.

In response to the commenters that expressed concern about the security requirements for particular data elements, the Commission notes that it believes that the best use of limited resources is to tailor security requirements to the security risk of the particular data element. No commenter quantified the relative risk of a breach that comes from in-flight data versus at-rest data or in-use data, and the Commission continues to believe that the largest risk of a breach comes from in-flight data. Thus, the adopted Plan will maintain higher security standards for in-flight data than for at-rest data or in-use data. The Commission also continues to believe that PII data warrants more security considerations than non-PII data, but it disagrees with the one commenter that recommended multiple levels of security for non-PII data.²⁷⁴⁶ In this case, the Commission does not believe that the benefits justify the costs of creating additional levels of data classification within non-PII data.

²⁷⁴⁶ ICI Letter at 6.

In response to the commenters that expressed concern about the risks of aggregating confidential data from disparate sources into one location, the Commission notes that it agrees that the CAT Data will be a particularly attractive target for bad actors. However, the Commission believes that the extensive, robust security requirements in the adopted Plan, as outlined in Section IV.D.6, provide appropriate, adequate protection for the CAT Data.

In response to the comments regarding the lack of security details in the Plan, the Commission continues to believe that, as discussed in the Notice, there is a degree of uncertainty with respect to the security measures that would be implemented by the Plan Processor, and consequently, uncertainty about the risk of a data breach.²⁷⁴⁷ As discussed in more detail above,²⁷⁴⁸ the Commission notes that the Participants have provided some additional information regarding security procedures. Additionally, as discussed above, the Commission is amending the Plan to require that the Participants conduct background checks for the employees and contractors of the Participants that will use the CAT System,²⁷⁴⁹ and to require that the Participants provide the Commission with an evaluation of the information security program to ensure that the program is consistent with the highest industry standards for the protection of data.²⁷⁵⁰ The Commission believes that this additional information mitigates some of the uncertainty, but continues to believe that there is significant uncertainty with respect to the risk of a breach. However, the Commission also recognizes that publicly releasing too many details

²⁷⁴⁷ See Notice, supra note 5, at 30733.

²⁷⁴⁸ See Section IV.D.6.a, supra.

²⁷⁴⁹ See Section IV.D.6.c, supra.

²⁷⁵⁰ See Section IV.H, supra.

about security requirements could create additional risk, and as discussed in Section IV.D.6, believes a reasonable level of detail has been provided.²⁷⁵¹

In response to comments about governance, the Commission notes that it has modified the Plan to address the concern regarding potential conflicts of interest on the part of the CCO and CISO. Specifically, as discussed in more detail above in Section IV.B.3, the CCO and CISO will have fiduciary duties to the CAT LLC in the same manner and extent as an officer of a Delaware corporation, and to the extent those duties conflict with duties the CCO and CISO have to the Plan Processor, the duties to the CAT LLC will control.²⁷⁵² As discussed above in Section IV.D.6, the CCO and CISO each have responsibilities related the security of CAT Data, and the potential for a conflict of interest could create uncertainty as to whether these responsibilities will be carried out in a way that will minimize the risk of a security breach. The Commission believes that the modifications to the Plan should reduce this uncertainty.

In response to the commenter who noted that the Notice did not specify the entity liable in the event of a data breach, the Commission notes that the Plan requires the Plan Processor's cyber incident response plan to address insurance issues related to security breaches, and that as part of the discussions on insurance coverage and liability, further detail about the distribution of costs will be undertaken, including details about who might bear the cost of a breach and under what specific circumstances. The Commission believes that these provisions in the Plan should provide incentives for the Plan Processor to manage security risks. However, because the cyber incident response plan will not be developed until after the Plan Processor has been selected, the

²⁷⁵¹ See CAT NMS Plan, *supra* note 5, at Appendix C, Section A.1(b) (discussing the manner in which the Central Repository will receive, extract, transform, load, and retain data); Section 6.10(c) (discussing the CAT user help desk).

²⁷⁵² Response Letter I at 17–19.

Commission does not know whether or under what circumstances the Plan Processor will bear the cost of a breach. While the Commission recognizes that this creates some uncertainty with respect to the incentives on the Plan Processor to minimize the risk of a security breach, the Commission is approving the Plan without further modification for the reasons discussed in Section IV.D.6.j, above.

5. Second Order Effects

In the Notice, the Commission recognized that a number of second-order effects could result from the approval of the Plan.²⁷⁵³ These included market-participant actions designed to avoid direct costs of a security breach; changes to CAT Reporter behavior due to increased surveillance; changes in CAT Reporter behavior to switch from one funding tier to another to qualify for lower fees; and changes in broker-dealer routing practices related to fee differentials across execution venues.

a. Security-Related Second Order Effects

In the Notice, the Commission recognized that the desire to avoid direct costs of a security breach could motivate actions that would cause second order effects.²⁷⁵⁴ The Commission illustrated this in the Notice by considering two specific examples of actions that Participants might take. First, if service bureaus perceive the costs and risks of a security breach to be great enough because of the addition of PII in the data, which is not included in current data, some could decide not to provide CAT Data reporting services.²⁷⁵⁵ Second, investors or

²⁷⁵³ See Notice, supra note 5, at 30733–34.

²⁷⁵⁴ Id.

²⁷⁵⁵ The Commission noted that this could increase the potential for a short term strain on capacity and exacerbate the costs. Id. at 30733.

other market participants could move their activity off-shore or cease market participation altogether to avoid having sensitive information stored in the Central Repository.²⁷⁵⁶ The Commission stated that it did not believe that the effect of the Plan on the risk or costs of a data breach would be great enough to result in significant second order effects.²⁷⁵⁷

The Commission received two comments on this issue. Both comments suggested that industry members would have to purchase insurance or cease domestic operations if the Plan Processor was not required to purchase an insurance policy that covers potential security breaches and extends to industry members to reimburse them for costs related to the breach.²⁷⁵⁸ Comments on another potential second order effect related to capital formation are addressed in more detail below in Section V.G.3.b.²⁷⁵⁹

In their response to comments, the Participants indicated that they are working on an agreement between themselves and the potential Plan Processors to cover liability, insurance, and indemnification, which would also make it less likely that industry members would move off-shore or cease operations.²⁷⁶⁰

The Commission recognizes that the purchase of insurance to cover these costs is a potential second order effect. As such, the Commission is revising its economic analysis to

²⁷⁵⁶ The Commission noted that consequences of changes in investor behavior in response to the threat of a breach include: Investors holding suboptimal portfolios; lost profits to the securities industry; and higher costs of raising capital for U.S.-based securities issuers, if the public's willingness to participate in capital markets is sufficiently reduced. Id. at 30734.

²⁷⁵⁷ Id.

²⁷⁵⁸ FSR Letter at 2; SIFMA Letter at 22.

²⁷⁵⁹ An analysis related to Capital Formation can be found in Section V.G.3., infra.

²⁷⁶⁰ Response Letter I at 59.

acknowledge this additional second order effect, but otherwise continues to believe that the security-related second order effects will be as anticipated in the Notice.

b. Changes to CAT Reporter Behavior

In the Notice, the Commission also acknowledged that increased surveillance could impose some costs by altering the behavior of market participants. The Commission stated that benefits could accrue to the extent that improved surveillance, investigation, and enforcement capabilities allow for regulators to better identify and address violative behavior when it occurs, and to the extent that common knowledge of improved capabilities deters violative behavior.²⁷⁶¹ In particular, the Commission acknowledged that some market participants could reduce economically beneficial behavior if those market participants believe that, because of enhanced surveillance, their activities would increase the level of regulatory scrutiny that they bear. Furthermore, the Commission stated that costs could accrue to the extent that some forms of market activity, which are permissible and economically beneficial to the market and investors, could come under greater scrutiny, which could create a disincentive to engage in that activity. For example, regulators could increase the number of inspections, examinations and enforcement proceedings that they initiate. To the extent that these activities result in a reduction in violative behavior, the market benefits by avoiding the costs of this behavior. To the extent, however, the additional regulatory activity increases the number of inspections, examinations and enforcement on permissible activities, market participants would incur the increased costs of facilitating these regulatory inquiries.

²⁷⁶¹ See Notice, supra note 5, at 30734.

Although the Commission did not receive any comments on the second order effects it discussed in the Notice, it did receive two comments on a second order effect related to the granularity of timestamps. As discussed in the Notice, the Plan requires CAT reporters to report sub-millisecond timestamps when the CAT reporter uses such timestamps internally.²⁷⁶² Two commenters noted that this requirement may discourage CAT reporters from using sub-millisecond timestamps internally, since this would require finer timestamp resolution in CAT reporting.²⁷⁶³ The Commission also received a comment on a second-order effect that could result from the tiered fee structure of broker-dealers based on message traffic.²⁷⁶⁴ The commenter suggested that the structure of the funding model might cause second-order effects related to the differential message traffic of different activities, and these effects may vary across securities based on their liquidity.

In response to comments on the granularity of timestamps, the Participants state that the quality of CAT Data would improve if the Plan required such timestamps to be reported by CAT reporters that use such timestamps internally.²⁷⁶⁵ Furthermore, in response to the comment that the imposition of a fee on message traffic would discourage liquidity provision, the Participants note that they actively considered the market quality concerns in devising the proposed funding model, and one of the reasons for proposing a tiered, fixed fee funding model was to limit the

²⁷⁶² Id. at 30764–65.

²⁷⁶³ FIF Letter at 12; SIFMA Letter at 35.

²⁷⁶⁴ SIFMA Letter at 16–17.

²⁷⁶⁵ Response Letter I at 28–29.

disincentives to providing liquidity to the market. In particular, the Participants believed that a funding model based on message volume was far more likely to affect market behavior.²⁷⁶⁶

With regards to comments on sub-millisecond timestamps, the Commission acknowledges that this requirement may prove to be a disincentive for market participants to use sub-millisecond timestamps internally; however, the Commission believes that for many market participants, capturing timestamps at a finer resolution supports analysis of the firm's data for business purposes that provide benefits such as improvement to trading strategies and measurement of execution costs, and the benefits of these business purposes may exceed the costs of reporting regulatory data with finer timestamps. However, the Commission acknowledges that for firms that do not perform such analyses, this requirement may prove to be a disincentive to adopting technologies that capture finer resolution timestamps.

The Commission agrees with the comment about second order effects related to the tiering of broker-dealer fees based on message traffic and is adding this second-order effect to its analysis. The funding model anticipates Central Repository costs being spread across broker-dealers according to activity tiers based on message traffic. This may cause broker-dealers to alter their behavior to avoid being assigned to a higher fee tier. For example, trading strategies that involve providing liquidity might be expected to generate more message traffic than strategies that take liquidity because providing liquidity generally requires posting many quotes on many venues. Furthermore, while a broker-dealer is seeking to provide liquidity, market prices may change causing the broker-dealer to have to update its quotes on many venues multiple times as it seeks to trade. Consequently, the funding model may create an incentive to

²⁷⁶⁶ Response Letter II at 16.

take rather than provide liquidity, which could reduce levels of market liquidity. Furthermore, these effects may vary across securities based on the liquidity of the security. As the commenter noted, “the quote-to-trade ratio for exchange-traded-products (“ETPs”) can be ten times greater than that for corporate stocks. This implies that market makers in ETPs may generate ten times the amount of message traffic per executed trade than market makers in corporate stock.”²⁷⁶⁷

Consequently, the Commission also agrees that the tiered funding model for broker-dealers may create disincentives to provide liquidity in less liquid securities, possibly resulting in less liquid markets for securities that are already considered illiquid. As discussed below, the Commission recognizes the potential differential effect on those broker-dealers that engage in market making in liquid stocks versus illiquid stocks and on those broker-dealers that engage in liquidity taking strategies versus those that engage in other strategies. Nonetheless, as explained above in Section IV.D.13.b, the Commission believes that the timestamp requirements contained in the CAT NMS Plan, including the requirement that a CAT Reporter report timestamps in increments finer than milliseconds if they do so in other systems, are reasonable and will improve regulators’ ability to sequence events.

c. Tiered Funding Model

In the Notice, the Commission stated its preliminary belief that establishing a small number of discrete fee tiers, as occurs under the Plan, could create incentives for CAT Reporters to alter their behavior to switch from one tier to another, thereby qualifying for lower fees.²⁷⁶⁸ Specifically, the Plan states that CAT Reporters would be classified into a number of groups based on reporter type and market share of share volume or message traffic and assessed a fixed

²⁷⁶⁷ SIFMA Letter at 17.

²⁷⁶⁸ See Notice, supra note 5, at 30734–35.

fee that is determined by this classification. The higher-activity groups would be assessed higher fees such that market participants who fall into the lower tiers have a fee advantage over the market participants that fall into the higher tiers. The Commission noted, however, that because this incentive is contingent on being near a fee-tier cutoff point, relatively few market participants will likely be affected and thus market quality effects will likely not be significant. Furthermore, for those market participants near a cutoff point, managing activity to avoid a higher fee tier would necessarily incur costs of lost business and potential loss of market share, and would possibly be difficult to implement, which should mitigate any effects on market quality.

The Commission also recognized that the tiering of fees could create calendar effects within markets. That is, the structure ultimately approved by the Operating Committee could affect market participant behavior near the end of a measuring period. For example, high levels of market activity during a measuring period might cause CAT Reporters to limit their activity near the end of a measurement period to avoid entering a higher fee tier. The Commission noted that the Operating Committee has discretion under the Plan governance structure to make the tier adjustments discussed in Section 11.1.d for individual CAT Reporters. This provision might mitigate incentives for individual market participants to alter market activities to reduce their expected CAT fees.

The Commission did not receive any comments related to its economic analysis regarding the market quality effects, calendar effects, or other effects due to the tiered structure of the funding model. While the Commission is making certain modifications to the funding model, as described in Section IV.F above, the funding model will continue to utilize a tiered structure. Consequently, the Commission continues to believe that the tiered fee structure could create

incentives for CAT Reporters to alter their behavior, but that market quality effects would likely not be significant. Nonetheless, the Commission expects that the required report by the Participants to study the impact of tiered-fees on market liquidity should provide insights into whether the fee model affects liquidity provision and ultimately market quality. This will assist the Commission's oversight of the Plan and assist the Operating Committee in understanding whether it needs to make adjustments to the Funding Model. Furthermore, for those market participants near a cutoff point, managing activity to avoid a higher fee tier would necessarily incur costs of lost business and potential loss of market share, and would possibly be difficult to implement, which should mitigate any effects on market quality.

The Commission is also updating its analysis based on the amendment to the Plan to clarify that the Operating Committee may only change the tier to which a Person is assigned in accordance with a fee schedule filed with the Commission.²⁷⁶⁹ Consequently, the Commission no longer believes that this provision would mitigate incentives for individual market participants to alter market activities to reduce their expected CAT fees. The Commission continues to recognize that CAT Reporters may have incentives to alter their behavior to switch from one tier to another.

d. Differential CAT Fees across Market Participants

In the Notice, the Commission discussed the funding model proposed in the Plan, which is a bifurcated funding model in which costs are first allocated between the group of all broker-dealers and the group of all Execution Venues, then within these groups by market activity

²⁷⁶⁹ See CAT NMS Plan, supra note 5, at Section 11.1(d).

level.²⁷⁷⁰ The Commission discussed its preliminary belief that the bifurcated funding model proposed in the Plan almost certainly would result in differential CAT costs between Execution Venues because it will assess fees differently on exchanges and ATSS. First, message traffic to and from an ATS would generate fee obligations on the broker-dealer that sponsors the ATS, while exchanges would incur almost no message traffic fees.²⁷⁷¹ Second, broker-dealers that internalize off-exchange order flow, generating off-exchange transactions outside of ATSS, would face a differential funding model compared to ATSS and exchanges.²⁷⁷² Specifically, broker-dealers internalizing orders would only pay fees based on message traffic, whereas orders routed to ATSS and exchanges would lead to broker-dealer fees based on message traffic and ATS or exchange fees based on market share. If these fees are even partially passed on to customers, then the cost differentials that result might create incentives for broker-dealers to route order flow to those broker-dealers who internalize in order to minimize costs, creating a potential conflict of interest with broker-dealers' investor customers.

In addition, the Commission discussed its preliminary belief that the funding model shifts broker-dealer costs associated with the Central Repository to all broker-dealers and away from Options Market Makers. The Plan provides that broker-dealers would not report their options quotations, while equity market makers would report their equity quotations to the Central Repository. This differential treatment of market making quotes would affect funding costs by (a) decreasing the number of messages that must be reported and stored by Options Market Makers, and (b) charging broker-dealers that do not quote listed options a higher share of broker-

²⁷⁷⁰ See Notice, supra note 5, at 30735–36.

²⁷⁷¹ See CAT NMS Plan, supra note 5, at Section 11.3.

²⁷⁷² Id.

dealer-assessed CAT fees than they would if Options Market Makers' quotes were included in the allocation of fees.

Although this differential treatment would marginally increase the cost of providing other broker-dealer services relative to options market making, the Commission discussed its belief that this would not materially affect a market participant's willingness to provide broker-dealer services other than options market making because (a) many market participants participate in both equities and options markets, and (b) broker-dealers participating in equity markets have significant infrastructure in place for serving that market and switching costs to participate in options market making are high.

In the Notice, the Commission also discussed the allocation of costs between the Execution Venues and the other Industry Members (i.e., broker-dealers) and solicited comment on alternative funding models.²⁷⁷³ Specifically, the Commission noted that the CAT NMS Plan does not detail the proportions of fees to be borne by Execution Venues versus Industry Members. The Notice also pointed out that Execution Venues would be tiered by market share to determine their fees while Industry Members would be tiered by message traffic. In its analysis, the Commission noted that assessing CAT costs on market participants by message traffic may have the benefit of aligning market participants' incentives with the Participants' stated goal of minimizing costs. The Commission also explained that while a broker-dealer's choice of business model is likely to determine its level of message activity, the majority of an exchange's message traffic is passive receipt of quote updates.²⁷⁷⁴ Further, because quotes must

²⁷⁷³ See Notice, supra note 5, at 30766–69.

²⁷⁷⁴ Using MIDAS data, Commission Staff analyzed the number of equity exchange proprietary feed messages and trades during the week of October 12, 2015 and provided

be updated on all exchanges when prices change, exchanges with low market share are likely to have more message traffic (incurring CAT fees) per executed transaction (generating revenue).²⁷⁷⁵ The Commission further explained that bifurcated fee approaches, such as the one in the Plan, may cause one Execution Venue to be relatively cheaper if Execution Venues pass costs on to members and subscribers and may exacerbate conflicts of interest for broker-dealers routing customer orders.

The Commission received comments that inform its analysis of differential fees across market participants, particularly focusing on the allocation to Participants versus broker-dealers. One commenter questioned why Participants were tiered by market share while broker-dealers were treated differently (by message traffic), and noted this could place a larger burden on market makers of liquid securities. The commenter explicitly stated that it is not suggesting that market-share tiers are wrong, but believes there should be a reason why Participant tiers are based on one metric (market share) while broker-dealer tiers are based on another metric (message traffic).²⁷⁷⁶ The Commission received several comments on issues related to cost differentials between Participants and broker-dealers that were not discussed in the Notice. One commenter noted that the profits from the fees would only be distributed among the Participants

the results in the Notice. The message per trade ratio varied across exchanges from 38.46 to 987.17, with a median of 57.21.

²⁷⁷⁵ The Commission's data analysis as reported in the Notice confirmed this for the smallest exchanges. Except for the smallest exchanges, the trade-to-message ratios range from about 0.016 trades for every quote update to about 0.026 trades for every quote update and appear constant across market share levels. However, the smallest exchanges by market share have only about 0.001 trades for every quote update to about 0.009 trades for every quote update.

²⁷⁷⁶ SIFMA Letter at 16–17.

and suggested these should be at least partially returned to broker-dealers.²⁷⁷⁷ Another commenter was concerned that SROs would use CAT profits to fund other SRO operations.²⁷⁷⁸ There were comments regarding the lack of transparency over fee calculations and metrics used to determine tiers, as well as the determination of the allocation split between broker-dealers and Participants—all of which increases uncertainty in cost estimates.²⁷⁷⁹ Finally, there were a number of comments that described the potential for a conflict of interest in the allocation of fees, and discussing the relative burden of funding on broker-dealers to SROs, estimating that at least 88% of costs will be borne by broker-dealers.²⁷⁸⁰

There were no comments related to the economic analysis regarding a double charging of ATSS.²⁷⁸¹ In addition, there were no comments regarding the economic analysis related to differences in costs between option market makers and equity market makers.²⁷⁸²

The Participants' response contains information that is relevant to the economic analysis with regards to transparency in funding and the allocation of costs. Specifically, the Participants commented that the Plan provides the Advisory Committee with the right to receive information concerning the operation of the CAT,²⁷⁸³ and that the Participants plan to provide the Advisory

²⁷⁷⁷ KCG Letter at 5.

²⁷⁷⁸ DAG Letter at 5.

²⁷⁷⁹ SIFMA Letter at 16; FSI Letter at 6.

²⁷⁸⁰ KCG Letter; SIFMA Letter; Fidelity Letter; FSR Letter; DAG Letter; Data Boiler Letter; Wachtel Letter; FSI Letter; STA Letter.

²⁷⁸¹ See Section VI.G.1.a.(1)A., supra.

²⁷⁸² While FIF recommends exempting equity market makers, they did not provide information that suggests revising the Commission's OMM vs equity market maker analysis. See FIF Letter at 65–66. Specifically, the letter says that equity market makers would get the same benefits as OMMs for the quotes that are not paired with orders.

²⁷⁸³ See CAT NMS Plan, supra note 5, at Section 4.13(d)–(e).

Committee with minutes of Operating Committee meetings.²⁷⁸⁴ The response addressed the concerns over transparency in decision making; however, the concerns regarding uncertainty in the metrics used to determine tiers and the final cost allocation split will not be resolved until the Plan Processor is chosen.

The Participants' supplemental response also contained information that is relevant to the economic analysis with respect to second order effects of the funding model. With regards to determining fees via message traffic for broker-dealers and market share for Participants, the Participants noted that message traffic is a key component of CAT operating costs, and that message traffic is strongly correlated with broker-dealer size. However, there is little correlation between message traffic and Execution Venue size, so charging large and small Execution Venues with similar message traffic would be inequitable. The Plan treats ATSs in the same manner as exchanges because their business models and anticipated burden on CAT are similar.²⁷⁸⁵

On this topic, the Participants proposed one modification to the plan. The Participants proposed to amend the manner in which market share will be calculated for a national securities association that has trades reported by its members to its trade reporting facility or facilities for reporting transactions effected otherwise than on an exchange in NMS Stock or OTC Equity Securities. For such an association, its market share for purposes of the funding model would not include the share volume reported to the national securities association by an ATS, as such share volume will be included in the market share calculation for that ATS.²⁷⁸⁶

²⁷⁸⁴ Response Letter I at 17.

²⁷⁸⁵ Response Letter II at 11, 13.

²⁷⁸⁶ Response Letter II at 12.

The Participants also responded that they expect to operate the CAT on a break-even basis—that is, the fees imposed and collected would be intended to cover CAT costs and an appropriate reserve for CAT costs, and any surpluses would be treated as an operational reserve to offset fees in future payment. In addition, the Participants subsequently stated that the CAT LLC will seek to qualify for tax exempt status as a “business league.”²⁷⁸⁷

With regards to fee transparency, the Participants noted that the details regarding the tiers are important considerations and are actively developing the tiers. Once the Plan Processor is selected, the Operating Committee will work with the Processor to finalize the tiers, and broker-dealers and other participants will have the opportunity to comment on the proposal as part of the approval process for an immediately effective rule filing.²⁷⁸⁸

With regards to the allocation of costs between Participants and broker-dealers and the potential for a conflict of interest in determining this allocation, the Participants noted that the proposed funding model is designed to recover costs associated with creating, implementing, and operating CAT as opposed to addressing costs of compliance, which might be incurred regardless of the funding model. In addition, there are over 100 times more broker-dealers expected to report to CAT than Participants. Therefore, the 88% aggregate cost figure quoted in the comments is less than what broker-dealers would be expected to pay in aggregate on a per-CAT reporter basis.²⁷⁸⁹ With regard to the potential conflict of interest, the Participants noted that broker-dealers and the public will have the opportunity to comment on fees, the SEC will be required to evaluate the fees for consistency with the Exchange Act, the funding proposal

²⁷⁸⁷ Participants’ Letter at 1; Section IV.B.4, *supra*.

²⁷⁸⁸ Response Letter II at 14. *See supra* note 1709.

²⁷⁸⁹ Response Letter II at 10–11.

expects that CAT will operate on a break-even basis, and Participants are prohibited from using regulatory fees for commercial purposes.²⁷⁹⁰

The Commission is revising its economic analysis in light of comments, the Participants' response, and Plan modifications. First, the Commission recognizes the validity of the comment that the funding tiers would place a larger burden on market makers of liquid securities relative to illiquid securities and place a lower burden on liquidity takers relative to those who provide liquidity. This could increase the incentive to broker-dealers to transact in more illiquid securities and reduce the incentive to provide liquidity. In response to the comment seeking the rationale behind the bifurcation in the funding model, the Commission notes that the Notice provided a rationale that the Commission continues to believe makes economic sense. Specifically, as summarized above, the Commission continues to believe that because message traffic is passive for exchanges and a business decision for Broker-Dealers, the bifurcated funding model will help align the incentives of market participants with the Participants' stated goal of minimizing costs. More broadly, the Commission continues to believe that because the CAT NMS Plan does not detail the proportions of fees to be borne by Execution Venues versus Industry Members, its economic analysis contains uncertainty regarding the differential fees to be borne by Execution Venues versus Industry Members.

With regards to the distribution of profits among SROs, the Commission is revising its economic analysis to incorporate the clarification in the Plan to the effect that profits from fees will go toward funding future costs instead of being redistributed among the SROs except in the two instances described above, as well as the modification to the Plan that reflects that the CAT

²⁷⁹⁰ Response Letter II at 17.

LLC will seek to qualify for tax exempt status as a “business league.”²⁷⁹¹ Broadly speaking, the Commission had been concerned about the competitive effects of distributing profits equally among SROs because, in profitable years, an equal distribution of profits would advantage smaller exchanges (larger exchanges in the case of losses). However, with the clarification and modification to the Plan, the Commission believes there will be little or no competitive effects resulting from distributions among SROs. The Commission also believes that this clarification and modification address commenter concerns about the distribution of CAT profits.

The Commission is updating its analysis of the differential fees on exchanges and ATSS to incorporate Plan modifications that would change the way national securities associations are treated in the Funding Model. The modified Plan would no longer double-count ATS volume as share volume for the purposes of placing both ATSS and FINRA in tiers in the Funding Model. However, because of the uncertainty in the ultimate Funding Model, the Commission recognizes that this modification may not impact the fees paid by either ATSS or FINRA and may not alleviate any fee differentials between ATSS and exchanges. As described earlier in this Section, these fee differentials may arise because message traffic to and from an ATS would generate fee obligations on the broker-dealer that sponsors the ATS, while exchanges incur almost no message traffic fees.²⁷⁹²

²⁷⁹¹ Participants’ Letter at 1.

²⁷⁹² See CAT NMS Plan, supra note 5 at Section 11.3.(b): (“For the avoidance of doubt, the fixed fees payable by Industry Members pursuant to this paragraph shall, in addition to any other applicable message traffic, include message traffic generated by: (i) an ATS that does not execute orders that is sponsored by such Industry Member; and (ii) routing orders to and from any ATS sponsored by such Industry Member.”) The Commission notes that exchange broker-dealers would be subject to message traffic fees as Industry Members under the Plan. However, the Commission notes that based on its analysis of

In addition, the Commission notes that other over-the-counter volume, such as occurs when orders are executed off-exchange against a broker-dealer's inventory, will still be assessed share volume fees while the message traffic that resulted in the executions will also be subject to fees through the broker-dealers that had order events related to the transactions. This contrasts to executions that occur on exchanges, where the venue that facilitates the execution does not pay fees for message traffic that led to the execution. This difference in treatment could still result in costs that are passed on to investors because broker-dealers have the incentive to route orders in a way that results in less order flow to those who pay higher CAT fees.

The Commission is not changing the economic analysis with respect to the allocation of costs between SROs and Broker-Dealers. As discussed in detail previously,²⁷⁹³ in response to the comments that suggested that Plan allocates 88% of the costs to broker-dealers, the Commission believes that the 88% figure cited is in reference to compliance costs, which are not "allocated" by the Plan. Fees to pay for the maintenance and operation of the Central Repository will be allocated via the funding model, and the current allocation of fees between broker-dealers and exchanges has not been determined.

The Commission is updating the Economic Analysis to reflect some improvements in financial transparency as a result of amendments to the Plan. Specifically, the Commission's amendment to the Plan to require that CAT LLC financial statements be prepared in accordance with GAAP and audited by an independent public accounting firm may substitute to a certain

OATS data from September 15–19, 2014, these broker-dealers are minor contributors to overall message traffic, accounting for less than 0.03% of OATS ROEs.

²⁷⁹³ See Section IV.E, *infra*.

extent for the added financial transparency sought by commenters.²⁷⁹⁴ Additionally, as per the Participants' response, all meeting minutes will be made available, and in addition, the Funding Model will be filed with the Commission and subject to public comment.²⁷⁹⁵ However, the Commission continues to recognize uncertainty in the ultimate allocation of fees.

G. Efficiency, Competition, and Capital Formation

In determining whether to approve the CAT NMS Plan, and whether the Plan is in the public interest, Rule 613 requires the Commission to consider the impact of the Plan on efficiency, competition and capital formation.²⁷⁹⁶

In the Notice, the Commission's analysis supported the preliminary belief that the Plan generally promotes competition.²⁷⁹⁷ However, the Commission recognized that the Plan could increase barriers to entry because of the costs to comply with the Plan. Further, the Commission's analysis in the Notice identified several limitations to competition, but stated that the Plan contains provisions to address some limitations and Commission oversight can also address the limitations.²⁷⁹⁸

The Commission's analysis in the Notice also supported the preliminary belief that the Plan would improve the efficiency of regulatory activities and enhance market efficiency by deterring violative activity that harms market efficiency. Further, the analysis in the Notice supported the Commission's preliminary belief that the Plan would have modest positive effects

²⁷⁹⁴ See CAT NMS Plan, supra note 5, at Section 9.2; see also Section IV.B.4; Participants' Letter II.

²⁷⁹⁵ See supra note 1709 for further details on fee proposals.

²⁷⁹⁶ 17 CFR 242.613(a)(5); see also 15 U.S.C. 78c(f).

²⁷⁹⁷ See Notice, supra note 5, at 30738.

²⁷⁹⁸ Id. at 30738–46.

on capital formation and that the threat of a security breach at the Central Repository would be unlikely to significantly harm capital formation.²⁷⁹⁹

At the same time, however, the Notice stated that the significant uncertainties discussed elsewhere in its economic analysis also affect the Commission's analysis of efficiency, competition, and capital formation.²⁸⁰⁰ Additionally, the Commission recognized that the Plan's likely effects on competition, efficiency and capital formation were dependent to some extent on the performance and decisions of the Plan Processor and the Operating Committee in implementing the Plan, and thus there was necessarily some further uncertainty in the Commission's analysis. Nonetheless, the Notice stated that the Commission preliminarily believed that the Plan contained certain governance provisions, as well as provisions relating to the selection and removal of the Plan Processor, that mitigate this concern regarding uncertainty by promoting decision-making that could, on balance, have positive effects on competition, efficiency, and capital formation.

Overall, after considering comments, the Participants' response, and modifications to the Plan, the Commission is updating and revising its economic analysis of competition, efficiency, and capital formation. However, the revisions in the analysis do not impact the Commission's broad conclusions. The Commission continues to believe that the Plan generally will promote competition, improve the efficiency of regulatory activities, promote market efficiency, and have modest positive effects on capital formation. Further, the Commission continues to recognize

²⁷⁹⁹ Id. at 30748–50

²⁸⁰⁰ Id. at 30738. As examples, the Commission recognized that the uncertainties around the improvements to data qualities could affect the conclusions on efficiency and the uncertainty regarding how the Operations Committee allocated the fees used to fund the Central Repository could affect the conclusions on competition.

the significant uncertainty and that certain provisions of the Plan could promote efficient decisions and implementation and could provide competitive incentives to the Plan Processor to promote good performance.

1. Competition

a. Market for Trading Services

In the Notice, the Commission analyzed the CAT NMS Plan's likely economic effects on competition in the market for trading services, as compared to the Baseline of the competitive environment without the Plan. The Commission stated that it preliminarily believed that the Plan would not place a significant burden on competition for trading services.²⁸⁰¹ The Commission also examined the effect of the funding model on competition in the market for trading services, including off-exchange liquidity suppliers and ATs. In addition, the Commission considered the effect of implementation and ongoing costs of the Plan, whether particular elements of the Plan could hinder competition, and the effect of enhanced surveillance on competition in the market for trading services. The Commission recognized the risk that the Plan would have negative effects on competition and increase the barriers to entry in this market, but discussed how the Plan provisions and Commission oversight could mitigate these risks.

The Commission discussed how the market for trading services—which is served by exchanges, ATs, and liquidity providers (internalizers and others) —relies on competition to supply investors with execution services at efficient prices. These trading venues, which compete to match traders with counterparties, provide a framework for price negotiation and disseminating trading information. The Commission observed that, since the adoption of

²⁸⁰¹ Id. at 30739–42.

Regulation NMS in 2005, there has been a shift in the market share of trading volume among trading venues. From 2005 to 2013, there was an increase in the market share of newer national securities exchanges and a decline in market share on NYSE. In addition, the proportion of NMS Stocks trading off-exchange (which includes both internalization and ATS trading) increased.

The Commission noted that the Plan examines the effect of the CAT NMS Plan on the market for trading services primarily from the perspective of the exchanges. The Plan asserts that distribution of regulatory costs incurred by the Plan would be distributed according to “the Plan’s funding principles,” calibrated to avoid placing “undue burden on exchanges relative to their core characteristics,” and would thus not cause any exchange to be at a relative “competitive disadvantage in a way that would materially impact the respective Execution Venue marketplaces.”²⁸⁰² Likewise, the Plan asserts that its method of cost allocation would avoid discouraging entry into the Participant community because a potential entrant, like an ATS, would “be assessed exactly the same amount [of allocated CAT-related fees] for a given level of activity” both before and after becoming an exchange.²⁸⁰³

In addition, in its final analysis described below, the Commission examines each of the issues in relation to competition in the market for trading services and revises its economic analysis in response to comments, the Participants’ response, and modifications to the Plan.

²⁸⁰² See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.8(a)(i); see also *id.* at Section 11.2 (for a discussion of the Plan’s funding principles).

²⁸⁰³ See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.8(a)(i).

(1) Funding

The Commission noted that the Operating Committee will fund the Central Repository by allocating its costs across exchanges, FINRA, ATs (“Execution Venues”) and broker-dealers (“Industry Members”), and will decide which proportion of costs would be funded by exchanges, FINRA, and ATs and which portion would be funded by broker-dealers. The Commission observed that the Plan does not specify how the Operating Committee would select the method of allocation. The Commission believed that any impacts of such fees on competition in the market for trading services will manifest either through the model for the fees itself or through the later allocation of the fees across market participant types, across equity or options exchanges, or within market participant types and markets, through the levels of fees paid by each tier.

A. Funding Model

In the Notice, the Commission discussed its preliminary belief that the structure of the funding model could provide a competitive advantage to exchanges.²⁸⁰⁴ Specifically, the Commission noted that the Plan states that an entity would be assessed exactly the same amount for a given level of activity whether it acted as an ATs or an exchange. However, FINRA would be charged fees based on the market share of off-exchange trading. ATs, which are FINRA members, would presumably pay a portion of the FINRA fee through their broker-dealer membership fees. In addition, ATs would pay a fee for their market share, which is a portion of the total off-exchange market share. Therefore, ATs volume would effectively be charged once to the broker-dealer operating the ATs and a second time to FINRA, which would result in ATs

²⁸⁰⁴ See Notice, supra note 5, at 30740.

paying more than exchanges for the same level of activity. Ultimately, if the funding model disadvantages ATs relative to exchanges, trading volume could migrate to exchanges in response, and ATs could have incentives to register as exchanges as well. Additionally, the Commission discussed its belief that the Participation Fee²⁸⁰⁵ could discourage new exchange entrants or the registration of an AT as an exchange, increasing the barriers to entry to becoming an exchange. However, the Commission also explained that because the funding model seems to charge ATs more for their market share than exchanges, ATs could pay relatively less for their market share as an exchange than as an AT, countering this barrier to entry depending on the magnitudes of the two fee types.

As described earlier,²⁸⁰⁶ the Participants propose to amend the manner in which market share will be calculated for a national securities association that has trades reported by its members to its trade reporting facility or facilities for reporting transactions effected otherwise than on an exchange in NMS Stock or OTC Equity Securities.²⁸⁰⁷ For such an association, its market share for purposes of qualifying for a particular tier in the funding model would not include the share volume reported to the national securities association by an AT, as such share volume will be included in the market share calculation for that AT.²⁸⁰⁸ As discussed above in Section IV.F, the Commission is modifying the Plan as the Participants suggested.

²⁸⁰⁵ The Participation Fee would be determined by the Operating Company and paid by national securities exchanges and national securities associations currently registered with the Commission (“Participants”) to fund costs incurred in creating, implementing and maintaining the CAT.

²⁸⁰⁶ See Section V.F.5.d, *supra*.

²⁸⁰⁷ Response Letter II at 12.

²⁸⁰⁸ Response Letter II at 12.

This modification reduces the potential for the Plan to charge ATSS more than similarly situated exchanges, but it may not alleviate all the fee differentials between ATSS and exchanges. As described above,²⁸⁰⁹ these fee differentials may arise because message traffic to and from an ATSS would generate fee obligations on the broker-dealer that sponsors the ATSS, while exchanges incur almost no message traffic fees. Even with this modification, the Commission continues to believe that the Funding Model could provide a competitive advantage to exchanges over ATSS. However, the Commission is approving the Plan without further modification for the reasons discussed in Section IV.F, above.

B. Allocation of Voting Rights and Fees

In the Notice, the Commission recognized that the potential for a burden on competition and effects on competitors in the market for trading services could arise from provisions relating to the allocation and exercise of voting rights.²⁸¹⁰ The Commission noted that the potential for concentration of influence over vote outcomes arises from proposed provisions to give one vote to each Plan Participant in an environment where some Participants are Affiliated SROs. Indeed, supermajority approval could be achieved through four of the 10 groups of Affiliated SROs and individual SROs, and majority approval could be achieved with just three such groups or individual SROs.²⁸¹¹ For example, the Participant groups with options exchanges could have the

²⁸⁰⁹ See Section V.F.5.d, *supra*.

²⁸¹⁰ See Notice, *supra* note 5, at 30740–41.

²⁸¹¹ At the time of the Notice, the twenty SROs that were Participants in the CAT NMS Plan included five sets of affiliated SROs (New York Stock Exchange LLC, NYSE Arca, Inc., and NYSE MKT LLC (the “NYSE Group”); The NASDAQ Stock Market LLC, NASDAQ OMX BX, Inc., and NASDAQ OMX PHLX LLC (the “NASDAQ Group”); BATS Exchange, Inc., BATS Y-Exchange, Inc., EDGX Exchange, Inc., and EDGA Exchange, Inc. (the “BATS Group”); Chicago Board Options Exchange, Inc. and C2 Options Exchange, Inc. (the “Chicago Options Group”); International Securities

incentive to allocate a disproportionately low level of fees for options market share than for equity market share. The Commission noted that such an allocation could disadvantage competing Participants with only equities exchanges.

The Commission also noted that the inclusion of all exchanges on the Operating Committee could give the Plan Participants opportunities and incentives to share information and coordinate strategies in ways that could reduce the competition among exchanges or could create a competitive advantage for exchanges over venues for off-exchange trading.²⁸¹² However, the Commission stated that it preliminarily believed that certain provisions of the Plan would limit these potential burdens on competition. In particular, the Plan includes provisions designed to limit the flow of information between the employees of the Plan Participants who serve as members of the Operating Committee and other employees of the Plan Participants.²⁸¹³

Exchange, LLC, ISE Gemini, LLC, and ISE Mercury, LLC (the “ISE Group”); and five independent SROs (National Stock Exchange, Inc.; Chicago Stock Exchange, Inc.; BOX Options Exchange LLC; Miami International Securities Exchange LLC; and Financial Industry Regulatory Authority, Inc.). The BATS Group would have had four votes, the NYSE Group, the NASDAQ Group and the ISE Group each would have had three votes, and the Chicago Options Group would have had two votes. See CAT NMS Plan, supra note 5, at Appendix C, Section D.11(b). A majority approval would have required eleven votes. This could have included as few as four of the SROs and sets of affiliated SROs: the affiliated SROs that would have had four votes, two sets of affiliated SROs that would have had three votes, and one other SRO or set of affiliated SROs. Supermajority approval would have required fourteen votes. This could have included as few as five SROs and sets of affiliated SROs: the affiliated SROs that would have had four votes, three sets of affiliated SROs with three votes, and any additional SRO. Note also that as few as two sets of affiliated SROs could have blocked a Supermajority approval by casting seven “no” votes: the affiliated SROs with four votes and any one of the affiliated SROs with three votes.

²⁸¹² The Commission also noted that FINRA could represent the perspectives of the off-exchange portion of the market, but FINRA would have only one vote and exchanges would have twenty.

²⁸¹³ See CAT NMS Plan, supra note 5, at Section 9.6; see also Section III.24, supra.

Additionally, the Commission agreed with the Plan's assessment that some governance features of the Plan will limit adverse effects on competition in the market for trading services. These include provisions limiting the incentive and ability of Operating Committee members to serve the private interests of their employers, such as the rules regulating conflicts of interest. Moreover, the Commission explained that it may summarily abrogate and require the filing of Plan amendments that establish or change a fee in accordance with Rule 608(a)(1) and review such amendments in accordance with Rule 608(b)(2) of Regulation NMS, if it appears to the Commission that such action is necessary or appropriate in the public interest, for the protection of investors, or the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system or otherwise in furtherance of the purposes of the Act.²⁸¹⁴ In such a case, if the Commission chooses to approve such amendment, it would be by order and with such changes or subject to such conditions as the Commission may deem necessary or appropriate.²⁸¹⁵

Several commenters provided information relevant to the Commission's analysis of the potential impact of the allocation of fees on competition. In particular, three commenters suggested that there was an inherent conflict of interest as the SROs were the only ones with votes, yet will be involved in the decision to allocate funding responsibility across SROs and

²⁸¹⁴ 17 CFR 242.608(a)(1); 608(b)(2); 608(b)(3)(i); and 608(b)(3)(iii). Pursuant to Rule 608(b)(2) of Regulation NMS, the Commission shall approve such amendment, with such changes or subject to such conditions as the Commission may deem necessary or appropriate, if it finds that such amendment is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanisms of, a national market system, or otherwise in furtherance of the purposes of the Act. Approval of the amendment shall be by Commission order.

²⁸¹⁵ See Notice, supra note 5, at 30741; supra note 1709 for further details on fee proposals.

broker-dealers.²⁸¹⁶ Such comments relate to the influence of voting rights on the allocation of fees to exchanges (SROs) compared to ATs and internalizers (broker-dealers). The Commission notes also that certain EMSAC discussions recognized conflicts in the market for trading services.²⁸¹⁷

The Commission believes that the concerns expressed in the comments and the EMSAC discussions are consistent with the Commission’s discussion and analysis of the potential impacts in the Notice. The Commission recognized in the Notice that bloc voting could create a competitive advantage for exchanges over trading venues for off-exchange trading. The commenters did not address the Commission’s discussion in the Notice of certain provisions in the Plan that would limit potential burdens on competition or of the role of the Commission in approving NMS Plan fee filings. The Commission notes that changes in the number of exchanges and in exchange groups since the Notice²⁸¹⁸ affect the potential influence of bloc voting because fewer SRO groups will be needed for approval or to block an approval.²⁸¹⁹

²⁸¹⁶ Fidelity Letter at 5, SIFMA Letter at 27 and KCG Letter at 4.

²⁸¹⁷ See “Recommendations Relating to Trading Venues Regulation”, Equity Market Structure Advisory Committee (“EMSAC”) Trading Venues Regulation Subcommittee, April 19, 2016, at 1, available at <https://www.sec.gov/spotlight/emsac/emsac-trading-venues-subcommittee-recommendations-041916.pdf> (describing four recommendations relating to the regulation of trading venues); see also EMSAC April 26, 2016 Transcript, available at <https://www.sec.gov/spotlight/emsac/emsac-042616-transcript.txt>.

²⁸¹⁸ Since the time of the Notice, the Commission approved a new exchange, the Investors' Exchange, LLC (“IEX”), which is an independent SRO, and two sets of affiliated SROs merged, the NASDAQ Group and the ISE Group.

²⁸¹⁹ The Plan now includes twenty-one SROs with votes on the Operating Committee, including four sets of affiliated SROs and six independent SROs. Compared to the time of the Notice (see *supra* note 2811), the number of votes required for majority or Supermajority approval remains the same, but the number of SRO blocks required for approval or to block an approval has changed. Now, the NASDAQ-ISE Group has six votes instead of separate blocs of three votes each. A majority approval still requires

Nonetheless, the Commission continues to believe that provisions in the Plan and Commission oversight of the allocation of fees could mitigate these concerns.²⁸²⁰

(2) Costs of Compliance

In the Notice, the Commission explained that because all Participants but one compete in the market for trading services, the ability of affiliates to vote as a group could in principle allow a few large Participant groups to influence the outcome of competition in the market for trading services by making various decisions that can alter the costs of one set of competitors more than another set.²⁸²¹ In addition, the Commission discussed the fact that the Plan calls for profits to be distributed equally among Participants, which could advantage smaller exchanges during profitable years and disadvantage smaller exchanges during loss years.²⁸²²

The Commission explained that generally, smaller competitors could have implementation and ongoing costs of compliance that are disproportionate relative to their size.

eleven votes. This could include as few as three of the SROs and sets of affiliated SROs instead of the former four: the affiliated SROs that have six votes, the affiliated SROs that have four votes, and one other SRO or set of affiliated SROs. Supermajority approval still requires fourteen votes. This could include as few as four SROs and sets of affiliated SROs instead of the former five: the affiliated SROs that have six votes, the affiliated SROs that have four votes, the affiliated SROs that have three votes, and any additional SRO or group of affiliated SROs. Note also that, now, as few as two sets of affiliated SROs, instead of the former three, could block a Supermajority approval by casting eight “no” votes: the affiliated SROs with six votes, and the affiliated SRO with two votes.

²⁸²⁰ See supra note 1709 for further details on fee proposals.

²⁸²¹ See Notice, supra note 5, at 30741–42.

²⁸²² Generally, smaller exchanges will have smaller fees. So, if there are profits, and each exchange receives the same nominal reimbursement amount, then the percentage reduction in fees from the redistributed profit will be greater for smaller exchanges, as they are starting with a smaller denominator in the ratio. This does not speak to the relative burden of compliance costs, however, which may still disadvantage smaller exchanges.

It noted that, to lessen the impact of funding the Central Repository on smaller exchanges and ATSS, the Plan would apply a tiered funding model that charges the smallest exchanges and ATSS the lowest fees. Likewise, the Plan would apply a tiered funding model that would charge the smallest broker-dealers, including liquidity suppliers, the lowest fees. However, the Commission noted that the Plan does not indicate whether off-exchange liquidity providers would pay fees similar to similarly-sized ATSS and exchanges. This is important because, as described earlier, broker-dealers internalizing orders off exchanges would only be allocated fees based on message traffic, whereas orders routed to ATSS and exchanges lead to broker-dealer fees based on message traffic and ATS or exchange fees based on market share. If these fees are even partially passed on to customers, then the cost differentials that result might create incentives for broker-dealers to route order flow to those broker-dealers who internalize in order to minimize costs, creating a potential conflict of interest with broker-dealers' investor customers.²⁸²³

The Commission discussed the fact that the Plan provides that the Technical Specifications will not be finalized until after the selection of a Plan Processor, which will not occur until after any decision by the Commission to approve the Plan. The Commission recognized that the costs of compliance associated with future technical choices or the selection of the Plan Processor could exacerbate the relative cost differential across competitors. However, the Commission preliminarily believed that the governance provisions of the Plan and Commission oversight could help to mitigate such effects in the market for trading services.

²⁸²³ See Section V.F.5.d, supra.

The Commission received several comments relevant to its analysis of the potential impact of the costs of compliance on competition in the market for trading services. Specifically, as described earlier,²⁸²⁴ several commenters had concerns about the distribution of CAT profits among SROs, though none specifically discussed the potential differential impact on small versus large exchanges.²⁸²⁵ Further, the concerns of commenters and the EMSAC discussed in the Allocation of Fees section above also have implications for the Commission’s analysis.

Regarding the distribution of CAT profits among SROs, as described earlier,²⁸²⁶ the Participants responded with a clarification that they expect to operate the CAT on a break-even basis and any surpluses would be treated as an operational reserve to offset fees in future payment. In addition, the Participants subsequently stated that the CAT LLC will seek to qualify for tax exempt status as a “business league.”²⁸²⁷

The Commission has considered the comments and the EMSAC discussion regarding voting blocs and believes that these concerns do not alter the analysis in the Notice for the same reasons as described above.²⁸²⁸ Overall, the Commission continues to believe that the ability of affiliates to vote as a group could in principle allow a few large Participant groups to influence the outcome of competition in the market for trading services by making various decisions that

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Id.

2825

SIFMA Letter at 19; KCG Letter at 5; DAG Letter at 5.

2826

See Section V.F.5.d, supra.

2827

Participants’ Letter at 1; Section IV.B.4, supra.

2828

See Section V.G.1.a(1)B, supra.

alter the costs of one set of competitors more than another set, but that Commission oversight and the governance provisions of the Plan and could help to mitigate these effects.²⁸²⁹

Also, in light of the amendment to the Plan to reflect that the CAT LLC will seek to qualify for tax exempt status as a “business league,”²⁸³⁰ the Commission now believes that neither CAT profits or losses should affect competition in the market for trading services. The Commission maintains its conclusions regarding the impact of compliance costs on competition in the market for trading services, specifically, that compliance costs may be relatively more burdensome for small SROs, but that the tiered aspect of the funding model should serve to mitigate this.

However, the Commission notes that the funding model continues to have uncertainties, and depends on the decisions of the Operating Committee.

(3) Enhanced Surveillance and Deterrence

In the Notice, the Commission also discussed its preliminary belief that the CAT NMS Plan could promote competition in the market for trading services through enhanced surveillance and the deterrence of violative behavior that could inhibit competition.²⁸³¹ Should the Plan deter violative behavior, passive liquidity suppliers, such as on or off-exchange market makers could increase profits as a result of reduced losses from others’ violative behavior. This increase in profits could encourage new entrants or could spark greater competition, which would reduce transaction costs for investors. For example, if the Plan facilitates surveillance improvements that deter spoofing, the Commission stated that it could increase incentives to provide liquidity

²⁸²⁹ See supra note 2814.

²⁸³⁰ Participants’ Letter at 1. See also Section V.F.5.d, supra, for more detail on these modifications and the resulting economic effects.

²⁸³¹ See Section V.E.2.c, supra, for a discussion of how the CAT NMS Plan would enhance surveillance and deter violative behavior.

and promote lower transaction costs for investors, particularly in stocks that may lack a critical mass of competing liquidity providers or that could be targets for violative trading behavior.

The Commission did not receive comments related to its economic analysis on enhanced surveillance and deterrence of violative behavior affecting competition in the market for trading services. Therefore, the Commission continues to believe that the CAT NMS Plan could promote competition in the market for trading services through enhanced surveillance and the deterrence of violative behavior that could inhibit competition.

b. Market for Broker-Dealer Services

In the Notice, the Commission analyzed the effect of the CAT NMS Plan on the market for broker-dealer services.²⁸³² The Commission stated that it preliminarily believed that the costs of broker-dealers' compliance, particularly the cost to report order events to the Central Repository, would differ substantially between broker-dealers and might affect competition between smaller and larger broker-dealers. The Commission also noted that broker-dealers that outsource regulatory data reporting activities are expected to see their costs of regulatory data reporting increase, while broker-dealers that insource may see a decrease in their regulatory data reporting costs.²⁸³³ The Commission stated that it preliminarily believed this dynamic might affect competition between Outsourcers (that tend to be smaller) and Insourcers (that tend to be larger), and might increase barriers to entry in some segments of this market.

The Notice discussed the Plan's assertion that it will have little to no adverse effect on competition between large broker-dealers, and will not materially disadvantage small broker-

²⁸³² The market for broker-dealer services is described in the Notice, supra note 5, at 30742–44.

²⁸³³ See Section V.E.2.c., supra.

dealers relative to large broker-dealers.²⁸³⁴ Regarding small broker-dealers, the Plan states, “. . . [the allocation of costs to broker-dealers based on their contribution to market activity] may be significant for some small firms, and may even impact their business models materially” and that the Participants were sensitive to the burdens the Plan could impose on small broker-dealers, noting that such broker-dealers could incur minimal costs under their existing regulatory reporting requirements “because they are OATS-exempt or excluded broker-dealers or limited purpose broker-dealers.” The Commission noted that the CAT NMS Plan attempts to mitigate its impact on these broker-dealers by proposing to follow a cost allocation formula that should charge lower fees to smaller broker-dealers;²⁸³⁵ furthermore, Rule 613 provides them additional time to commence their reporting requirements.

The Commission preliminarily agreed with the Plan’s general assessment of competition among broker-dealers, and also with the Plan’s assessment of differential effects on small versus large broker-dealers. The Commission agreed that the Plan’s funding model was an explicit source of financial obligation for broker-dealers and therefore an important feature to evaluate when considering potential differential effects of the Plan on competition in the market for broker-dealers. However, the Commission preliminarily believed that the segments of the market most likely to experience higher barriers to entry are those that currently have no data reporting requirements of the type the Plan requires and those that will involve more CAT

²⁸³⁴ See CAT NMS Plan, supra note 5, at Appendix C B.8.(a)(ii).

²⁸³⁵ See CAT NMS Plan, supra note 5, at Appendix C B.7.(b)(iv)(C) (“The fees to be assessed at each tier are calculated so as to recoup a proportion of costs appropriate to the message traffic from firms in each tier. Therefore, larger broker-dealers, generating the majority of message traffic, will be in the higher tiers, and therefore be charged a higher fee. Smaller broker-dealers with low levels of message traffic will be in lower tiers and will be assessed a minimal fee for the CAT. The Participants estimate that up to 75% of broker-dealers will be in the lower tiers of the Funding Model.”).

Reporting obligations, such as the part of the broker-dealer market that involves connecting to exchanges, because of the technology infrastructure requirements and the potential to have to report several types of order events. Nonetheless, the Commission discussed its preliminary belief that any increases in the barriers to entry are justified because they are necessary in order for the CAT Data to include data from small broker-dealers. Specifically, the Commission noted that excluding small broker-dealers from reporting requirements would eliminate the collection of audit trail information from a segment of the broker-dealer community and would thus result in an audit trail that does not capture all orders by all participants in the securities markets.²⁸³⁶

The Commission also recognized that the Plan could affect the current relative competitive positions of broker-dealers in the market for broker-dealer services because the economic impacts resulting from the Plan could benefit some broker-dealers and adversely affect others. However, the Commission stated that there is no clear reason to expect these impacts, should they occur, to decrease the current state of overall competition in the market for broker-dealer services so as to materially burden the price or quality of services received by investors on average.

Regardless of the differential effects of the CAT NMS Plan on small versus large broker-dealers, the Commission discussed in the Notice that its preliminary view was that the CAT NMS Plan, in aggregate, will likely not reduce competition and efficiency in the overall market for broker-dealer services. The Commission explained that even if small broker-dealers potentially face a burden, this may not necessarily have an adverse effect on competition as a whole in the overall market for broker-dealer services. Under the Plan, broker-dealers could face

²⁸³⁶ See Notice, supra note 5, at 30743 (citing Adopting Release, supra note 14, at 45749).

high upfront costs to set up a processing environment to meet reporting responsibilities. As upfront, fixed costs, the burden could be greater for small broker-dealers. Instead of bearing these costs in-house, small broker-dealers could contract with outside vendors, which could lead to lower costs relative to not using a vendor for reporting services. Thus, the Commission explained that even firms that currently do not report to OATS, but will be CAT Reporters under the Plan, could face manageable upfront costs that permit them to continue in their line of business without a severe setback in their profitability.

The Commission noted that a difficulty in assessing the likely impacts of the CAT NMS Plan on competition among broker-dealers is that competition in the markets for different broker-dealer services could be affected in different ways. If CAT costs represent a significant increase in overall business costs, the Plan could disadvantage broker-dealers who are CAT Reporters in the market segments that do not require CAT reporting. For example, broker-dealers that, in addition to providing services related to market transactions that are reportable to CAT, also compete to provide fixed-income order entry as a line of business may be at a relative disadvantage to competitors in the fixed-income market who do not provide broker-dealer services that are related to market activity that is reportable to CAT.

The Commission recognized that the CAT NMS Plan could result in fewer broker-dealers providing specialized services that trigger CAT reporting obligations. The Commission also recognized, however, that fewer broker-dealers in a specialized segment of the market may not necessarily harm competition in that segment. In particular, the CAT compliance costs may be less of a relative burden for large broker-dealers who may provide a larger portfolio of specialized services to clients. This portfolio may buffer large broker-dealers from business risk associated with specialization, and so large broker-dealers are likely to maintain their presence in

specialized market segments. If a sufficient number of large broker-dealers maintain their presence in specialized market segments, a net decrease in broker-dealers may not affect the competition in such market segments to a level in which the market segment offers fewer or lower quality services or higher prices.²⁸³⁷ However, the Commission recognized that negative effects on competition in specialized market segments could result if broker-dealers achieve a level of market concentration necessary to adversely affect prices for investors.

The Commission received a few comment letters regarding its analysis of the effect of the Plan on the market for broker-dealer services. As previously described,²⁸³⁸ the Commission received one comment that noted that message traffic tiers could place a larger burden on market makers of liquid securities and a lower burden on liquidity takers.²⁸³⁹ In addition, one commenter noted that the current phased implementation schedule poses risks to clearing firms who will have to support both large and small broker-dealers during CAT implementation, incurring more CAT implementation costs than broker-dealers that do not have introducing broker-dealers.²⁸⁴⁰ Another comment estimated that CAT reporting costs, even at a \$5,000 per month minimum, could reach 15% or more of revenue for a subset of small broker-dealers that are currently OATS exempt.²⁸⁴¹ The commenter further stated that the Plan would have the greatest proportionate burden for those firms, which have the smallest justification for regulatory concern²⁸⁴² and

²⁸³⁷ See Notice, supra note 5, at 30742–44.

²⁸³⁸ See Section V.F.5.d, supra.

²⁸³⁹ SIFMA Letter at 16–17.

²⁸⁴⁰ TR Letter at 3–4.

²⁸⁴¹ Wachtel Letter at 1–4.

²⁸⁴² Wachtel Letter at 2–4 (stating that customers of certain small firms are unlikely to engage in violative behavior such as market manipulation and insider trading).

expressed concern regarding the ability for certain firms to stay in business, stating that the Plan would “destroy the business model and profitability” of such firms.

The Participants’ response letter addressed comments related to the market for broker-dealer services. With regards to the funding model tiers placing a larger burden on market makers of liquid securities, the Participants did not comment on the relative burden, but argued that a fixed-fee funding model would reduce the disincentives to provide liquidity to the market and would lead to fewer market distortions than a strictly variable funding model.²⁸⁴³ With regards to the phased implementation schedule, the Participants noted that small broker-dealers may voluntarily begin reporting within two years instead of the required three years,²⁸⁴⁴ but did not address whether this poses risks for clearing firms supporting both large and small broker-dealers. The Participants also did not address the relative burden on OATS-exempt broker-dealers.

In response to these comments, the Commission has revised its economic analysis of the effect of the Plan on the market for broker-dealer services. First, the Commission now recognizes the potential differential effect on those broker-dealers that engage in market making in liquid stocks versus illiquid stocks and on those broker-dealers that engage in liquidity taking strategies versus those that engage in other strategies. The Commission believes that this differential effect could result in broker-dealers altering their activities, which could have the second order effects described above,²⁸⁴⁵ and could change the level of competition in certain market segments, such as those that specialize in providing services in more liquid securities.

²⁸⁴³ Response Letter II at 16.

²⁸⁴⁴ Response Letter II at 20.

²⁸⁴⁵ See Section V.F.5.b., supra.

However, the Commission believes that services in liquid securities is the most competitive segment in the broker-dealer industry and therefore, does not believe that effects on competition would be material. In particular, based on Commission Staff experience, the Commission understands that quote competition in liquid securities comes from market makers on many exchanges, over-the-counter market makers, and customers who post quotations. These securities trade on one penny spreads and have deep order books. Further, consistent with the Participants' Response Letter II, the tiered nature of the funding model effectively fixes the fees. In highly competitive markets, fixed fees should not affect prices. Therefore, the highly competitive liquid securities markets should remain liquid and highly competitive under the Plan, despite the fees related to message traffic.

The Commission also agrees with the comment that certain broker-dealers could face a disproportionately large burden of costs from reporting, even as high as 15% of revenue as the commenter noted, and already recognized this possibility in the economic analysis in the Notice. However, the Commission is not revising its conclusion that it is necessary for even the smallest broker-dealers to report to CAT. Specifically, the Commission believes that excluding certain broker-dealers from reporting requirements would result in an audit trail that does not capture all orders by all participants in the securities markets, which could incentivize prospective wrongdoers to utilize these firms to evade regulatory oversight.

With regards to competition, the Commission continues to believe that even if regulatory burdens from CAT reduce the number of small broker-dealers in specialized segments, overall competition in those segments may not be harmed.

With regards to the comment on relative costs for clearing firms supporting large and small brokers during CAT implementation, the Commission acknowledges the costs of reporting

to duplicative systems, and the relatively high costs to introducing broker-dealers. However, it is not clear why the additional costs to clearing firms servicing other broker-dealers would not be passed along to small broker-dealers—the impact of which has already been discussed. As such, the Commission does not believe the impact on clearing firms due to the phased implementation schedule is sufficiently large to affect competition in this market, and is not changing the Economic Analysis as it relates to costs for clearing services.

The Commission does not believe that the modifications to the funding model described above will affect the allocation of fees or the relative compliance costs among broker-dealers.²⁸⁴⁶ Overall, the Commission continues to believe that the CAT NMS Plan, in aggregate, would likely not reduce competition and efficiency in the overall market for broker-dealer services. Even if small broker-dealers, broker-dealers of liquid securities, or clearing firms of large and small broker-dealers potentially face a relatively high burden, this may not necessarily have an adverse effect on competition as a whole in the overall market for broker-dealer services, as the Commission explained in the Notice.

c. Market for Regulatory Services

In the Notice, the Commission discussed its preliminary conclusion that the Plan could provide opportunities for increased competition in the market to provide regulatory services.²⁸⁴⁷ The Commission noted that SROs compete to provide regulatory services in at least two ways. First, because SROs are responsible for regulating trading within venues they operate, their regulatory services are bundled with their operation of the venue. Consequently, for a broker-dealer, selecting a trading venue also entails the selection of a provider of regulatory services

²⁸⁴⁶ Id.

²⁸⁴⁷ See Notice, supra note 5, at 30744–45.

surrounding the trading activity. Second, SROs could provide this supervision not only for their own trading venues, but for other SROs' trading venues as well through the use of Regulatory Service Agreements or a plan approved pursuant to Rule 17d-2 under the Exchange Act.²⁸⁴⁸ Consequently, SROs compete to provide regulatory services to trading venues they do not operate. The market for regulatory services in the equity and options markets currently has one dominant competitor, FINRA.

In the Notice, the Commission noted that under the Plan, designated regulatory Staff from all of the SROs would have access to CAT Data, which would reduce the differences in data access across SROs.²⁸⁴⁹ This in turn could reduce barriers to entry in providing regulatory services because data will be centralized and standardized, possibly reducing economies of scale in performing surveillance activities. Furthermore, because some types of previously infeasible surveillance will become possible with the availability of additional data, the Commission believes that SROs will have greater opportunities to innovate in the type of surveillance that is performed, and the efficiency with which it is performed. In addition, as Rule 613(a)(3)(iv) requires, SROs will implement new or updated surveillance within 14 months after effectiveness of the CAT NMS Plan,²⁸⁵⁰ and thus any SRO could reconsider its approach to outsourcing its regulatory services and whether it wants to compete to provide regulatory services to others.

²⁸⁴⁸ 17 CFR 240.17d-2.

²⁸⁴⁹ Without a Central Repository, an SRO wishing to compete as a regulatory services provider would need to invest in the IT infrastructure and enter into the data access agreements necessary to surveil broadly beyond its exchanges' data resources. By providing access to consolidated trade and order data to all SROs, CAT may reduce barriers to entry for this market. See Securities Exchange Act Release No. 74581 (March 25, 2015), 80 FR 18035 (April 2, 2015) at 18057–58 (describing the barriers to entry of potential new national securities associations).

²⁸⁵⁰ 17 CFR 242.613(a)(3)(iv).

While the Commission did not receive any comments addressing the effects of the CAT NMS Plan on the market for regulatory services, nor was the issue addressed in the Participants' response, the Commission believes that certain EMSAC discussions are relevant to its analysis of competition in the market for regulatory services. In particular, the discussions regarding the EMSAC draft recommendation that the Commission should formalize by Rule the centralization of common regulatory functions across SROs into a single regulator reveal other potential considerations.²⁸⁵¹ In particular, the EMSAC subcommittee on Trading Venues opined that some regulatory activities are duplicative and needlessly complex because they are dispersed across SROs.²⁸⁵² Further, the subcommittee argued that CAT will increase that duplicative regulatory oversight. In response to the EMSAC discussions, one commenter pointed out benefits in having competition between regulators.²⁸⁵³ This commenter explained that CAT Data could open up new frontiers for regulation that competition between multiple SROs could leverage off of.

The Commission recognizes that increased competition in the market for regulatory services could create duplication of regulations, as the EMSAC discussed. But, ultimately, the Commission's conclusions related to competition—namely, that the Plan will provide

²⁸⁵¹ See “Recommendations Relating to Trading Venues Regulation”, Equity Market Structure Advisory Committee (“EMSAC”) Trading Venues Regulation Subcommittee, April 19, 2016, available at <https://www.sec.gov/spotlight/emsac/emsac-trading-venues-subcommittee-recommendations-041916.pdf> (describing four recommendations relating to the regulation of trading venues); see also EMSAC April 26, 2016 Transcript, available at <https://www.sec.gov/spotlight/emsac/emsac-042616-transcript.txt>.

²⁸⁵² See EMSAC April 26, 2016 Transcript, available at <https://www.sec.gov/spotlight/emsac/emsac-042616-transcript.txt>, at 111.

²⁸⁵³ See NASDAQ comment on EMSAC, May 24, 2016, available at <https://www.sec.gov/comments/265-29/26529-71.pdf>.

opportunities for increased competition in the market to provide regulatory services—are unchanged from the Notice. The Commission recognizes, however, the uncertainty of whether EMSAC will make a formal recommendation to the Commission and whether and how the Commission would act with respect to such a recommendation.

d. Market for Regulatory Data Reporting Services

In the Notice, the Commission analyzed the effect of the CAT NMS Plan on competition in the market for data reporting services with a focus on its impact on the costs incurred by broker-dealers to comply with the Plan.²⁸⁵⁴ As discussed in the Costs section above, the Commission preliminarily believed that many broker-dealers, particularly smaller broker-dealers, would fulfill their CAT reporting obligations by outsourcing to service bureaus and that the fees charged by the service bureaus would be a major cost driver for these broker-dealers. Further, these fees would factor into the increase in barriers to entry in the market for broker-dealer services.²⁸⁵⁵ Therefore, the Commission preliminarily believed that any effects on competition in the market for regulatory data reporting services could have a significant effect on the costs incurred by broker-dealers in complying with the CAT NMS Plan.

The Plan provided information on broker-dealers' use of third-party service providers to accomplish current regulatory data reporting. The Plan noted that while some broker-dealers perform their regulatory data reporting in-house, others outsource this activity. As noted in the Costs section of the Plan,²⁸⁵⁶ the Commission understands that most firms outsource the bulk of their regulatory data reporting to third-party firms. The Commission preliminarily believed that

²⁸⁵⁴ See Notice, supra note 5, at 30745–46.

²⁸⁵⁵ See Section V.G.1.b, supra.

²⁸⁵⁶ See Section V.F.1.c.(2).A, supra.

the competition in the market to provide data reporting services is a product of firms choosing to perform this activity in-house or to outsource it based on a number of considerations including cost, with some firms choosing to outsource this activity across multiple service providers.

The market for regulatory data reporting services is currently characterized by bundling, high switching costs, and barriers to entry. First, service bureaus often bundle regulatory data reporting services with an order-handling system service that provides broker-dealers with market access and order routing capabilities.²⁸⁵⁷ Additionally, they sometimes bundle regulatory data reporting services with trade clearing services. Second, switching costs for service bureaus may be high and involve complex onboarding processes and requirements. Furthermore, systems between service bureaus may be disparate, and switching service providers may require different or updated client documentation. Difficulty switching between service providers could limit the competition among service bureaus to provide data reporting services, and impact the costs that Outsourcers incur to secure regulatory data reporting services. Third, high information technology (“IT”) infrastructure costs also give rise to barriers to entry, which could slow the entry of new market participants into this market. Despite this, the Commission explained that based on information from broker-dealer discussions arranged by Financial Information Forum it preliminarily believed that the market for regulatory data reporting services is generally expanding and the trend is for more, not less, outsourcing.²⁸⁵⁸

In the Notice, the Commission discussed its preliminary belief that the Plan could alter the competitive landscape in the market for data reporting services in several ways.

²⁸⁵⁷ See Section V.F.1.c.(2).A, supra, for more information on broker-dealer use of service bureaus.

²⁸⁵⁸ See Notice, supra note 5, at n.920.

First, the Plan could increase the demand for data reporting services by requiring reporting by broker-dealers that may have previously been exempt due to size under individual SRO rules.²⁸⁵⁹ Because more broker-dealers would be required to report regulatory data under the Plan, the Commission preliminarily believed there could be an opportunity for increased competition in this market which might benefit all Outsourcers by reducing costs or increasing innovation. However, the increase in demand for data reporting services could serve to entrench existing providers if they capture a large share of newly created demand; this could lead to relatively higher costs for broker-dealers than they would face in a more competitive market. The potential increase in demand for data reporting services also could impact the capacity of already existing service providers to meet this increase in demand, and this in turn could have implications for competition and pricing in the market for data reporting services. Considering the barriers to entry that characterize the market for data reporting services and this potential increase in demand, service bureaus could have less incentive to compete for broker-dealer clients because these clients are no longer scarce, and as such, the CAT NMS Plan could result in a decline in the competition for data reporting services. It is possible that broker-dealers seeking to establish relationships with service bureaus could have trouble securing them because of the need to onboard many broker-dealers at once, especially if the service bureaus have limited on-boarding capacity. In the short-run these capacity constraints and the high demand could increase the costs of reporting through a service bureau. However, the two year implementation period for large broker-dealers and three year period for small broker-dealers could alleviate the reduction in competition due to the onboarding capacity strain because current service bureaus have time to

²⁸⁵⁹ See, e.g., FINRA Rule 7470.

increase their on-boarding capacity and new entrants have time to build the necessary IT infrastructure and a client base.

Second, the Commission discussed in the Notice how the CAT NMS Plan could dramatically change the pool of firms demanding data reporting services, which would be skewed toward firms that are smaller and on average costlier to service, which could result in higher prices that could eventually be passed onto investors. In addition to small and medium sized broker-dealers that previously self-reported data to SROs, who now would be required to report, the CAT NMS Plan would also result in other broker-dealers having data reporting responsibilities. The Commission preliminarily believed that these broker-dealers would predominantly be small. Because the Plan would require additional elements in regulatory data, particularly customer data, some broker-dealers that currently self-report could no longer find it economically feasible to do so.

Third, in addition to possibly increasing demand for data reporting services, the Commission discussed how the CAT NMS Plan may have a mixed effect on the number of firms offering data reporting services. This could impact the competitiveness of this market, and affect the costs broker-dealers bear in securing these services. On one hand, the number of firms offering data reporting services could decrease, because the need to secure PII might increase the likelihood of liability and litigation risks in the event of a security breach.²⁸⁶⁰ On the other hand, it is possible that the number of service bureaus offering data reporting services would increase. New reporting requirements for broker-dealers could create opportunities for new entrants to meet this demand. This could increase capacity and result in innovation in providing these

²⁸⁶⁰ See Section V.F.4.a(3), *supra*, for a discussion of the potential exit of service bureaus from the market resulting from the risk of a security breach.

services, which could benefit broker-dealers needing data reporting services by potentially reducing reporting costs, or at least reducing the potential for cost increases. Lower reporting costs for broker-dealers could in turn benefit the investors who are serviced by these broker-dealers, through reduced costs.

Fourth, the Commission discussed how the Plan could decrease the demand for data reporting services. Many broker-dealers currently pay service bureaus to fulfill their regulatory data reporting; this may be because these broker-dealers find it would be more expensive to handle the translation of their order management system data into fixed formats, such as is required for OATS. If the Plan Processor allows broker-dealers to send data to the Central Repository in the formats that they use for normal operations, in drop copies for example, these broker-dealers may no longer see a cost advantage in engaging the services of a regulatory data reporting service provider because one of the costs associated with regulatory data reporting—having to translate data into a fixed format—will have been eliminated.²⁸⁶¹ These broker-dealers may then choose to insource their regulatory data reporting.

The Commission preliminarily believed that this reduction in demand would not likely be realized and, if realized, would be unlikely to offset the increase in demand that would come from CAT reporters not currently subject to OATS reporting, who would now have reporting obligations. As noted in the Costs section of the Plan, of the 1,800 expected CAT Reporters, 868

²⁸⁶¹ The Plan does not mandate the data ingestion format. See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(b). In the Notice, the Commission recognized that the CAT Reporters Study found no difference in expected costs for a fixed format, but requested comment on why the costs may be similar when it would seem logical that allowing flexible data reporting formats would reduce costs for broker-dealers. See Notice, supra note 5, at Section IV.F.5.

do not currently report to OATS.²⁸⁶² This meant that the Commission expected a large proportion of CAT Reporters may be broker-dealers that currently do not have a service bureau for regulatory data reporting but would choose to engage one to manage their CAT reporting responsibilities. This is more than the Commission's estimate of 806 current outsourcing broker-dealers.²⁸⁶³ The Commission therefore noted that it is unlikely that the number of current Outsourcers that choose to become Insourcers would be larger than the number of non-OATS reporters that would elect to outsource. As a result, demand is more likely to increase. Further, the Commission explained that the proposed requirement for CAT reports to use listing exchange symbology could require pre-report data processing even if the Plan Processor allows for the receipt of reports in the formats that broker-dealers use for normal operations. As a result, the Commission explained that the CAT NMS Plan is unlikely to eliminate the costs of processing data prior to reporting that data to the Central Repository.

The Commission continues to believe that it is possible that the Plan would increase the demand for data reporting services by requiring regulatory data reporting by broker-dealers that may have previously been exempt due to size under individual SRO rules. Furthermore, the Commission continues to believe that the CAT NMS Plan may have a mixed effect on the number of firms offering data reporting services; this could impact the competitiveness of this market, and affect the costs broker-dealers bear in securing these services. Commenters did not provide any additional information or analysis that the Commission believes would warrant

²⁸⁶² The Plan estimates that 1,800 broker-dealers are expected to have CAT reporting obligations. Based on data from FINRA, 932 broker-dealers currently report OATS data. $1,800 - 932 = 868$. See Section VI.F.1.c.(2)A, supra.

²⁸⁶³ Id.

changes to its analysis or conclusions as set out in the Notice, nor does the Commission believe that the modifications to the Plan warrant changes to this aspect of the economic analysis.

2. Efficiency

In the Notice, the Commission analyzed the potential impact of the Plan on efficiency.²⁸⁶⁴ The Plan included a discussion of certain efficiency effects anticipated if the Plan is approved; as part of its economic analysis, the Commission discussed these effects, as well as additional effects anticipated by the Commission. The Commission discussed its preliminary belief that the Plan would likely result in significant improvements in efficiency related to how regulatory data is collected and used. The Commission also explained that the Plan could result in improvements in market efficiency by deterring violative activity. However, the Commission noted that any potential gains to efficiency from the retirement of duplicative and outdated reporting systems would be delayed for up to two and a half years and the interim period of increased duplicative reporting would impose significant financial burden on Industry Members.

Overall, after considering comments, Participants' responses, and modifications to the Plan, the Commission is updating and revising its economic analysis on efficiency. However, the revisions in the analysis do not impact the Commission's broad conclusions. The Commission continues to believe that the Plan will generally improve the efficiency of regulatory activities and promote market efficiency.

a. Effect of the Plan on Efficiency

Building off the discussion in the Plan, in the Notice, the Commission analyzed the effect of the Plan on the efficiency of detecting violative behavior through examinations and

²⁸⁶⁴ See Notice, supra note 5, at 30746–48.

enforcement, on the efficiency of surveillance, on market efficiency through deterrence of violative behavior, on operational efficiency of CAT Reporters, and on efficiencies through reduced ad hoc data requests and quicker access to data.²⁸⁶⁵

The Commission explained that currently, regulators' ability to efficiently supervise and surveil market participants and carry out their enforcement responsibilities is hindered by limitations in regulatory data.²⁸⁶⁶ Second, regulators' ability to efficiently perform cross-market surveillance is also hindered by limitations in regulatory data.²⁸⁶⁷ Finally, there are a number of other inefficiencies associated with the current system of regulatory data collection. These include: delays in data availability to regulators; lack of direct access to data collected by other regulators results in numerous ad-hoc data requests; and the need for regulatory Staff to invest significant time and resources to reconciling disparate data sources.²⁸⁶⁸

The Plan discussed a number of expected effects on efficiency such as: monitoring for rule violations; performing surveillance; and supporting fewer reporting systems. The Commission preliminarily agreed with the Plan's assessments of the expected effects, and in addition, the Commission discussed how the Plan could also reduce violative behavior.

First, the Plan concluded that SROs would experience improved efficiency in the detection of rule violations, particularly for violations that involve trading in multiple

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Id.

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See Section V.E.2.c, supra.

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Id.

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See Section V.D.2.b, supra. These other inefficiencies are discussed above in the Baseline and Benefits Sections.

markets.²⁸⁶⁹ The Plan stated an expectation that SROs would need to expend fewer resources to detect violative cross-market activity, and such activity would be detected more quickly.²⁸⁷⁰ The Commission preliminarily agreed that the Plan would result in improvements in efficiency in the performance of examinations of market participants by SROs and the Commission.

Improvements to data availability and access through the Central Repository could allow SROs and the Commission to more efficiently identify market participants for examination.²⁸⁷¹ The Commission also agreed that the Plan would improve the efficiency of enforcement investigations. If regulatory data access improves, the quality and quantity of enforcement investigations could increase through improvements to the comprehensiveness and timeliness of data used to support investigations.

Second, the Plan stated that the Participants believe that the CAT NMS Plan could improve the efficiency of surveillance.²⁸⁷² This improvement is due to a number of factors including: increased surveillance capacity; improved system speed, which would result in more efficient data analysis; and a reduction in surveillance system downtime.²⁸⁷³ The Plan also cited

²⁸⁶⁹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.8(b); see also Section V.E.2, supra.

²⁸⁷⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.8(b).

²⁸⁷¹ See Section V.E.2.c, supra.

²⁸⁷² See CAT NMS Plan, supra note 5, at Appendix C, Section B.8(b) (stating that the CAT NMS Plan could reduce monitoring costs, enable regulators to detect cross-market violative activity more quickly, provide regulators more fulsome access to unprocessed data and timely and accurate information on market activity, and provide CAT Reporters with long term efficiencies resulting from the increase in surveillance capabilities); see also Section V.E.2.c, supra.

²⁸⁷³ See CAT NMS Plan, supra note 5, at Appendix C, Section B.8(b). The Participants surveyed the 10 exchange-operating SRO groups on surveillance downtime. In conversations with Commission staff, the Participants informed Staff that average

reduced monitoring costs,²⁸⁷⁴ but the Commission noted that estimates in the Costs section of the Plan predicted increased surveillance costs if the Plan is approved. The increased surveillance costs predicted in the Plan could reflect more effective surveillance. Although the Plan did not discuss the cost-benefit tradeoff of increased surveillance directly, the Commission noted that achieving the level of surveillance that would be possible if the Plan is approved would likely be more expensive using currently available data sources, if it is achievable at all, due to the inefficiencies that currently exist in delivering regulatory supervision, which are discussed previously.²⁸⁷⁵

Third, the Plan also discussed increased efficiency due to the reduction in redundant reporting systems,²⁸⁷⁶ specifically increases in system standardization, which would allow consolidation of resources, including the sunseting of legacy reporting systems and processes, as well as consolidated data processing envisioned from the Plan.²⁸⁷⁷ However, the Commission noted that it is aware that the Plan calls for a period of years during which Industry Members would face duplicative reporting systems before older regulatory data reporting systems are

surveillance downtime was 0.03% from August 1, 2014 to August 31, 2015, and ranged from 0 to 0.21% across SROs.

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Id.

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See Section VI.E.2, supra.

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See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C) (discussing benefits of CAT to broker-dealers).

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Id. at Appendix C, Section B.8(b).

retired.²⁸⁷⁸ This period of duplicative reporting would impose a considerable financial burden on Industry Members.²⁸⁷⁹

The Plan also discussed two other possible efficiency improvements: a reduction in ad-hoc data requests and more fulsome access to raw data. While the Plan anticipated a decrease in ad-hoc data requests as a result of Plan-related data improvements, the Commission noted some types of ad-hoc data requests, such as, data requests for later-stage investigations might increase.²⁸⁸⁰ The Commission recognized that these increases in data requests would partially offset the efficiency improvements from the reduction in data requests noted above, but the Commission preliminarily believed that the Plan would reduce the total number of data requests.²⁸⁸¹ Furthermore, the Plan anticipated more robust access to unprocessed regulatory data, which could improve the efficiency with which SROs and the Commission could respond to market events where they previously had to submit data requests and wait for data validation procedures to be completed before accessing data collected by other regulators.²⁸⁸²

In addition to the potential benefits to efficiency discussed in the Plan, the Commission also discussed that CAT may reduce violative behavior. Improvements in the efficiency of market surveillance, investigations, and enforcement could directly reduce the amount of

²⁸⁷⁸ Id. at Appendix C, Section B.9.

²⁸⁷⁹ See Section VI.F.2, supra, for a discussion of duplicative reporting and whether broker-dealers would pass costs on to investors.

²⁸⁸⁰ Examples of data requests for later-stage investigations could include commissions paid or locate identifiers.

²⁸⁸¹ The Commission acknowledged that this decrease in total number of data requests may be partially offset by an increase in the number of investigations in general, because enhanced surveillance is likely to detect more potentially violative activity that would need to be investigated.

²⁸⁸² See CAT NMS Plan, supra note 5, at Appendix C, Section B.8(b).

violative behavior by identifying and penalizing market participants who violate rules and who would more easily go undetected in the current regime. Furthermore, market participants' awareness regarding improvements in the efficiency of market surveillance, investigations, and enforcement (or perceptions thereof), and the resultant increase in the probability of incurring a costly penalty for violative behavior, could deter violative behavior.²⁸⁸³ Reductions in violative behavior through both of these economic channels could improve market efficiency.²⁸⁸⁴

The Commission received a comment on the cost estimates of the CAT NMS Plan and its effects on increasing the efficiency of surveillance activities. The commenter agreed with the Commission's findings that the estimate of total implementation cost was accurate, however, the commenter stated that it is implausible that CAT would reduce surveillance costs by more than 40% while simultaneously improving the effectiveness of surveillance.²⁸⁸⁵

The Commission also received a comment on whether the CAT NMS Plan would increase the efficiency in detecting rule violations and subsequent gains to market efficiency due to the reduction in violative behavior.²⁸⁸⁶ The commenter disagreed with the Commission's analysis of the Plan's effect on market efficiency due to the reductions in violative behavior, arguing that effectively and efficiently deterring violative behavior should be done by using a

²⁸⁸³ See, e.g., Schelling, Thomas, "The Strategy of Conflict: Prospectus for a Reorientation of Game Theory," Journal of Conflict Resolution, Vol. 2 No. 3 (1958); Ellsberg, Daniel, "The Crude Analysis of Strategic Choices," American Economic Review, Vol. 51, No. 2 (1961).

²⁸⁸⁴ The implicit assumption here is that violative behavior receives diminishing marginal gains and generates increasing marginal harm. See, e.g., Becker, Gary and William Landes, "Essays in the Economics of Crime and Punishment," Columbia University Press (1974).

²⁸⁸⁵ Data Boiler Letter at 38.

²⁸⁸⁶ Data Boiler Letter at 10, 35.

system other than the CAT, preferably the commenter's proposed system which involves the use of real-time analytics.²⁸⁸⁷

The Commission also received numerous comments on whether the retirement of duplicative reporting systems and the reduction in ad-hoc data requests would generate gains to efficiency. One commenter disagreed with the Commission's analysis of the effect of the Plan on the reduction in duplicative reporting and ad-hoc requests.²⁸⁸⁸ Three commenters indicated that the period of duplicative reporting could also reduce the expected benefits of CAT.²⁸⁸⁹ One of these commenters suggested that the Plan's timeline for the retirement of duplicative reporting does not provide the SROs with sufficient incentives to migrate surveillances to CAT, implying that there could be a reduction in the efficiency of surveillance.²⁸⁹⁰ Another commenter emphasized the inherent complexities of dual reporting, and the impact that this would have on the efficiency and effectiveness of reporting during this period.²⁸⁹¹

While the Participants did not directly respond to comments regarding efficiency, they did state that they expect cost savings as a result of moving surveillance operations from existing systems to the CAT.²⁸⁹²

The Commission considered these comments, the Participants' response, and modifications to the Plan, and is revising its analysis of the inefficiencies associated with

²⁸⁸⁷ Data Boiler Letter at 10–13, 33, 38.

²⁸⁸⁸ Data Boiler Letter at 38–39.

²⁸⁸⁹ FIF Letter at 29–30; SIFMA Letter at 5; DAG Letter at 2.

²⁸⁹⁰ SIFMA Letter at 5.

²⁸⁹¹ FIF Letter at 30.

²⁸⁹² Response Letter II at 16.

duplicative reporting. The Commission is not revising its analysis or conclusions with regard to other aspects of efficiency.

First, the Commission disagrees with the commenter who raised concerns about the surveillance cost estimates. As discussed above, all 19 SROs²⁸⁹³ responded to the Participants Study regarding cost estimates, and most SROs have experience collecting audit trail data as well as expertise in their business practices. Furthermore, the commenter provided no reasoning or estimates to indicate that the Participants are unable to reasonably estimate their current data reporting costs, and the Participants' Response Letter II confirms the anticipated cost savings described in the Notice. Therefore, the Commission continues to believe that the cost estimates in the Notice are accurate, and that the CAT NMS Plan would improve the efficiency of surveillance by fostering increased surveillance capacity; improved system speed, which would result in more efficient data analysis; and a reduction in surveillance downtime.²⁸⁹⁴

Second, the Commission disagrees with the commenter that stated that the CAT Plan would not improve market efficiency due to reductions in violative behavior, and that the Plan should adopt real-time analytics. The Commission continues to believe that real-time analytics are not necessarily required to reduce violative behavior. Analysis of raw data on T+1 and corrected data after T+3 can reveal violative activity nonetheless.

Third, regarding the commenter who seems to imply that the Commission attributes savings in surveillance costs solely to the reduction in ad-hoc data requests, which is not the case. As discussed in the Notice, the Commission believes that it is possible that Participants

²⁸⁹³ At the time of the Participants Study, there were 19 SROs. All responded to the study. See Section V.F.1.b, supra for discussion of the Participants Study and changes to cost estimates to account for additional Participants.

²⁸⁹⁴ See supra note 2873.

and the Commission could realize efficiencies from having data standardized and centrally hosted that could allow them to handle fewer ad hoc data requests. In addition, the Plan could allow Participants and the Commission to automate some surveillance processes that may currently be labor intensive or processed on legacy systems, which could reduce costs because the primary driver of these costs is FTE costs.²⁸⁹⁵

The Commission agrees with the commenters that suggested that the period of duplicative reporting could be associated with reduced benefits from the Plan. In particular, the Commission now acknowledges that in addition to involving significant costs, the period of duplicative reporting would be associated with reduced benefits in the form of potentially lower data quality and potential loss of efficiency and effectiveness of reporting in the short-term. Examples of losses in efficiency could include conflicting field definitions in CAT and OATS; differences in required corrections to the same errors across two different systems; and contention for the same reporting resources applied across two or more systems.²⁸⁹⁶

Regarding the comment that SROs lack incentives to retire duplicative reporting systems, the Commission notes that the requirement that SROs implement surveillance using the Central Repository within 14 months of the Effective Date limits the incentives for the SROs to delay retiring duplicative systems because they will gain the capability of performing surveillance within CAT. However, the Commission acknowledges that small Industry Members will not yet be reporting to the Central Repository when the SROs gain this capacity. Consequently, SROs will by necessity be performing surveillance on data other than CAT Data until small Industry Members are reporting to the Central Repository and their CAT Data quality allows adequate

²⁸⁹⁵ See Notice, supra note 5, at 30711.

²⁸⁹⁶ FIF Letter at 30.

surveillance using CAT Data. As discussed in Participants' Response Letter II, as the Participants face significant costs in running duplicative systems, and to the extent that such systems are extraneous for regulatory purposes, the Participants would desire to cease their operation.²⁸⁹⁷ Consequently, the Commission believes the SROs are incented to retire these duplicative systems and move surveillance solely to the Central Repository as quickly as feasible.

After considering these comments and responses from the Participants, potential changes in the Plan, the Commission has updated its analysis of the effects of duplicative reporting on efficiency. First, the Commission has updated its estimate of the expected duplicative reporting period and now believes that it is likely to be shorter than estimated in the Notice.²⁸⁹⁸ This would potentially result in the Commission and SROs realizing gains to efficiency earlier than what was stated in the Notice. Second, as discussed previously, the Commission now acknowledges that duplicative reporting may not result in efficiencies with duplicative reporting costs of less than \$1.7 billion.²⁸⁹⁹ Furthermore, the Commission now believes that the period of duplicative reporting may create inefficiencies, such as contention for the same reporting resources to correct errors across two different systems, and that might reduce the quality of data being reporting to CAT during the period of duplicative reporting.²⁹⁰⁰ Regardless of the loss in efficiency due to duplicative reporting, the Commission nonetheless believes that the Plan will result in long-term gains to efficiency for the reasons stated earlier in this Section.

²⁸⁹⁷ Response Letter II at 20.

²⁸⁹⁸ See Section V.F.2.b, supra.

²⁸⁹⁹ Id.

²⁹⁰⁰ See supra note 2896.

b. Effects of Certain Costs of the Plan on Efficiency

In the Notice, the Commission discussed the fact that the Plan anticipated that the implementation of CAT will introduce new costs related to data mapping and data dictionary creation, and add new expenditures, such as staff time for compliance with encryption requirements associated with the transmission of PII.²⁹⁰¹ While the Commission recognized these are additional activities and costs that the Plan would require, it viewed these as additional costs rather than inefficiencies. While the Commission could not quantify the magnitude of these costs, it viewed these as having a relatively minor contribution to overall costs of the Plan because they impose technical requirements on systems that the industry will need to significantly alter to comply with other provisions in the Plan.²⁹⁰² Commenters did not provide any additional information or analysis that the Commission believes would warrant changes to its analysis or conclusions regarding these costs and therefore continues to view these as costs rather than inefficiencies

Additionally, the Commission discussed the Plan's statement that there could be a market inefficiency effect related to the funding proposal for the Plan. The Plan indicated that the Funding Model for the Plan could create disincentives for the provision of liquidity, which could impair market quality and increase the costs to investors to transact.²⁹⁰³ The Commission discussed in the Notice two ways that the cost allocation methodology could negatively impact efficiency. First, data reporters could respond to the Funding Model by taking actions to limit their fee payments, such as exiting the market or reducing their activity levels. Second, the

²⁹⁰¹ See Notice, supra note 5, at 30748.

²⁹⁰² See Section VI.G.2.a, supra.

²⁹⁰³ See CAT NMS Plan, supra note 5, at Appendix C, Section B.8(b).

funding proposal for the CAT NMS Plan to align fees closely with the amounts that are required to cover costs could create incentives for the Plan Processor or Operating Committee to propose a cost schedule for the CAT that matches a given fee schedule, but is not the most efficient cost schedule for meeting CAT's regulatory objectives.

The Commission received a comment about the concerns the funding proposal in the Plan poses for liquidity provision.²⁹⁰⁴ This comment echoed the concerns the Commission discussed in the Notice. The Participants responded to this comment and noted that they actively considered the market quality concerns in devising the proposed funding model, and one of the reasons for proposing a tiered, fixed fee funding model was to limit the disincentives to providing liquidity to the market. In particular, the Participants believed that a funding model based on message volume was far more likely to affect market behavior.²⁹⁰⁵

In response to this comment, the Commission notes that it is amending the Plan to require the Participants to provide the Commission with a report on the impact of tiered-fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity 36 months after effectiveness of the Plan.²⁹⁰⁶ While the Commission continues to recognize that negative effects on efficiency could result from the Funding Model, for the reasons discussed in Section IV.F above, the Commission is approving the Funding Model as amended by the Commission.²⁹⁰⁷

²⁹⁰⁴ SIFMA Letter at 16–17.

²⁹⁰⁵ Response Letter II at 16.

²⁹⁰⁶ See Section IV.F.3., supra.

²⁹⁰⁷ See Section IV.F, supra.

3. Capital Formation

a. Enhanced Investor Protection

In the Notice, the Commission examined the potential effects on capital formation discussed in the Plan in addition to other potential effects on capital formation that the Commission believed could result if the Plan is approved.²⁹⁰⁸ The Plan's analysis regarding capital formation concluded that the Plan would generally not have a deleterious effect on capital formation and could bolster capital formation that could lead to increased investor participation in capital markets. The Commission agreed with the rationale of the Plan's analysis, but addressed some additional considerations regarding the scope of the Plan's effects on capital formation, as well as the channels through which these effects could accrue. The Commission preliminarily believed that the Plan would have a modest positive effect on capital formation.²⁹⁰⁹

The Plan's analysis stated that the Plan may improve capital formation by improving investor confidence in the market due to improvements in surveillance. As discussed previously,²⁹¹⁰ in the Notice the Commission discussed its preliminary belief that the Plan would provide substantial enhancements to investor protection through improvements to surveillance, particularly for cross-market trading.²⁹¹¹ Improved surveillance, as well as other regulatory activities, could decrease the rate of violative activity in the market, reducing investor losses due to violative activity. If investors expect fewer losses, this may increase capital formation by

²⁹⁰⁸ See Notice, supra note 5, at 30748–49.

²⁹⁰⁹ Id. at 30748–50.

²⁹¹⁰ See Notice, supra note 5, at Section IV.E.2.c(1); see also CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(B)(1)–(2), B.7(b)(iii)(C).

²⁹¹¹ FINRA currently provides cross-market surveillance, but limitations in the data (e.g., reliable cross-market linkages, customer identification, parent order identification) limit the scope and reliability of this surveillance.

facilitating a market where investors could be more likely to mobilize capital into securities markets.

In the Notice, the Commission discussed its preliminary belief that the CAT NMS Plan could provide additional increases to capital formation in the form of improved allocative efficiency of existing capital within the industry. If investors perceive an environment of improved surveillance, they could be willing to allocate additional capital to liquidity provision or other activities that increase market efficiency. Further, an environment of improved surveillance could result in the reduction of capital allocated to violative activities that impose costs on other market participants, because these market participants may no longer find it desirable to engage in behavior that exposes them to regulatory action.

The Commission explained, however, that market participants engaging in allowable activity that might be subject to additional regulatory scrutiny under the Plan could allocate capital to other activities to avoid this scrutiny, because even when activity is not violative, interacting with regulators can be costly for market participants.²⁹¹² This reallocation away from allowable activity to avoid regulatory interactions could result in capital allocations that are less efficient.

The Plan stated that the costs from CAT are unlikely to deter investor participation in the capital markets.²⁹¹³ The Commission noted, however, that the final costs of the Plan and the Funding Model for CAT are not wholly certain at this time; thus, it is the Commission's view

²⁹¹² See Section V.E.2.c., *supra*, for a discussion of the potential for the efficiencies in surveillance, examinations, and investigations to increase the number of regulatory actions, including investigations of conduct that turns out not to violate laws or regulations.

²⁹¹³ See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.8(c).

that there is uncertainty concerning the extent to which investors will bear Plan costs and consequently to what extent Plan costs could affect investors' allocation of capital. Despite these potential costs to investors, the Commission noted that investors could believe that any additional benefits they receive from the potential of a market that is more effectively regulated justify any additional costs they pay to access capital markets.

The Commission received several comments on whether the Plan would improve capital formation through investor protection against abusive behavior, and by fostering investor participation. One commenter stated that the Commission needs the CAT Plan not only to understand breakdowns in trading markets, but also to rid the markets of increasingly abusive trading practices. Doing this will protect investors, and foster investor participation, thereby fueling capital formation.²⁹¹⁴ Another commenter disagreed with the Commission's analysis and concluded that the Plan could adversely impact investors' trust in the markets because the Plan lacks connection with real-world problems (i.e., huge investment losses can be accumulated within a split-second; market collapse does not take more than one day; abusive use of financial engineering techniques to synthetically create trades/derivatives to bypass controls).²⁹¹⁵

In response to the commenter who mentioned that the Commission needs the CAT Plan to not only understand breakdowns in trading markets, but also rid the markets of abusive trading practices, the Commission has noted previously that CAT Data would help regulators with analysis and reconstruction of market events, and also help regulators identify violative behavior and abusive trading through their enforcement investigations.²⁹¹⁶

²⁹¹⁴ Better Markets Letter at 3.

²⁹¹⁵ Data Boiler Letter at 39.

²⁹¹⁶ See Section V.E.2.c(1), supra; Section V.E.2.c(3), supra.

The Commission also disagrees with the commenter who concluded that the Plan could adversely impact investors' trust in the markets because the Plan lacks a connection with "real-world problems." The Commission believes the Plan has a connection with these "real-world problems" because as stated above, CAT Data would help regulators analyze and reconstruct markets,²⁹¹⁷ thereby helping them understand how split-second losses accumulate to investors and the underpinnings of market collapses. CAT Data would also help regulators with surveillance and investigation activities,²⁹¹⁸ and potentially help them to understand the abusive use of financial engineering techniques. The Commission therefore believes that the benefits that CAT Data would provide regulators would also provide benefits to investors of a safer environment for allocating their capital and making financial decisions.

Moreover, the changes to the Plan further support the Commission's preliminary conclusions. Requiring Industry Members to report their LEI to the Central Repository if they have one should result in a greater ability for regulators to identify traders based on their Customer-IDs for the purposes of SRO surveillance. Potentially improved data completeness in terms of Customer-IDs could result in greater benefits to surveillance that would spillover to capital formation than stated in the Notice.

b. Data Security

In the Notice, the Commission agreed with the Plan's assessment that data security concerns are unlikely to materially affect capital formation.²⁹¹⁹ In its discussion of capital formation, the Plan recognized that data security concerns could potentially impact capital

²⁹¹⁷ See Section V.E.2.a., supra.

²⁹¹⁸ See Section V.E.2.c., supra.

²⁹¹⁹ See Notice, supra note 5, at 30749–50.

formation through market participants' perception that sensitive proprietary data might be vulnerable in case of a data breach at the Central Repository. The Plan's analysis discussed the security measures that are required by Rule 613 and the manner in which they have been implemented in the Plan. It concluded that these security measures are sufficient and that it is unlikely market participants would reduce their participation in markets in a manner that would affect capital formation. The Commission agreed that concerns regarding data security are unlikely to substantially affect capital formation, but that some uncertainty about the risks exist because of the variations in the potential security solutions and their resulting effectiveness.²⁹²⁰

In the Notice, the Commission discussed how the consequences of a data breach, nonetheless, could be quite severe. A data breach could substantially harm market participants by exposing proprietary information, such as a proprietary trading strategy or the existence of a significant business relationship with either a counterparty or client. The Commission noted, however, that broker-dealers already bear such risks in transmitting regulatory data to SROs and the Commission. The Commission believed that the marginal increase in the risks to broker-dealers associated with a data breach would be unlikely to deter broker-dealers from participating in markets. Finally, the Commission noted that a data breach could potentially reveal PII of investors. To address the potential for harm to the investing public and the health of capital markets through such a breach, the Plan has enhanced requirements for security around PII. The Commission believed that the risk of a breach of PII data would not materially affect investors' willingness to participate in markets because they already face these risks with PII shared with broker-dealers, though not in one centralized location.

²⁹²⁰ Id. at 30749.

Several commenters wrote about data security, and the comments are summarized above in Section IV.D.6. Only one commenter discussed the effects of data security on capital formation. That commenter asserted that “[i]f investors perceive that the CAT NMS plan leaves their trading strategies and position information vulnerable to discovery and predatory use, interest in equity investing may decrease to the detriment of liquidity and, ultimately, capital formation.”²⁹²¹ The Commission agrees that investors are sensitive to the protection of their data. The Plan amendments and Participants’ responses to comments provide more details about the required security provisions and more clarity on the applicability of Regulation SCI standards. The Commission believes that these changes should increase the security of CAT Data, and that concerns regarding data security are unlikely to affect capital formation substantially even though there may still be uncertainty regarding potential security solutions and their effectiveness.²⁹²²

4. Related Considerations Affecting Competition, Efficiency and Capital Formation

The Commission in the Notice recognized that the Plan’s likely effects on competition, efficiency, and capital formation are dependent to some extent on the performance and decisions of the Plan Processor and the Operating Committee in implementing the Plan, and thus that there is necessarily some uncertainty in the Commission’s analysis.²⁹²³ The Commission noted that nonetheless, it believed that the Plan contains certain governance provisions, as well as provisions relating to the selection and removal of the Plan Processor, that mitigate this

²⁹²¹ ICI Letter at 3.

²⁹²² See Notice, supra note 5, at 30749.

²⁹²³ See Notice, supra note 5, at 30750; see also the discussion of the CAT governance structure in Notice, supra note 5, at Section IV.E.4.d, supra.

uncertainty by promoting decision-making that could, on balance, have positive effects on competition, efficiency, and capital formation.²⁹²⁴

a. The Efficiency of the Plan

(1) Plan Decision-Making Process

The Commission in the Notice stated its preliminary belief that certain governance provisions in the Plan could create inefficiencies in the decision-making process, but that these inefficiencies are limited or exist to promote better decision-making.²⁹²⁵ Specifically, the Notice stated that the Plan specified three types of voting protocols and when each protocol applies: unanimous voting (only in three circumstances), supermajority voting (in instances considered by the Participants to have a direct and significant impact on the functioning, management, and financing of the CAT system), or majority voting (other, routine matters that arise in the ordinary course of business; as a practical matter the default standard).²⁹²⁶ The Commission discussed how the Plan's voting protocols balanced the efficiency of the decision-making process against the value of considering minority and dissenting opinions. Furthermore, the Commission stated its preliminary agreement with the Plan's discussion of the need to balance efficiency in the voting protocols in the Plan and the Participants' conclusion that the inefficiencies in the voting protocols in the Plan are limited enough to strike a balance between the inefficiencies of the decision-making process and the quality of the decisions.²⁹²⁷

²⁹²⁴ See Notice, supra note 5, at 30750.

²⁹²⁵ Id.

²⁹²⁶ Id.

²⁹²⁷ Id. at 30750–51.

The Commission further noted that the Plan discusses the role of industry representation as part of the governance structure.²⁹²⁸ The Commission preliminarily agreed with the discussion in the Plan that including industry representation might result in a more efficiently designed CAT, but that an Advisory Committee also adds operational inefficiencies.²⁹²⁹ The Commission further stated its preliminary belief that as long as the Advisory Committee adds sufficiently useful information, the benefits from the Advisory Committee would justify any operational inefficiencies from the inclusion of the Advisory Committee.²⁹³⁰

The Commission is not revising its analysis of the efficiency of the Plan's decision-making process at this time. As discussed above, commenters provided information on concerns about current NMS Plan governance and made suggestions on how to more effectively include the Advisory Committee in decisions.²⁹³¹ However, these commenters did not provide new insights into the efficiency of the decision-making process itself. As noted above, changes to plan governance to provide greater prominence to certain views could improve plan decision-making, to the extent that better-informed decisions would be superior decisions; on the other hand, larger or more diverse sets of voices could result in deadlocked or delayed decisions, which would impede the efficiency of the decision-making process under the CAT Plan. However, as noted above, the Commission is considering changes more broadly to NMS Plan governance, and any such changes may impact the CAT NMS Plan.²⁹³²

²⁹²⁸ Id. at 30751.

²⁹²⁹ Id.

²⁹³⁰ Id.

²⁹³¹ See Section V.E.3.d(2)B, supra.

²⁹³² Id.

(2) Level of Detail in the Plan

The Commission in the Notice also considered an additional source of potential inefficiencies: minimum standards for particular provisions or solutions in Appendix D of the Plan, rather than a specification of the solutions themselves in the Plan.²⁹³³ The Commission stated that while this approach creates uncertainties surrounding the economic effects of the Plan in the approval process, it also means that the Operating Committee and/or Selection Committee would effectively decide upon the unspecified details when selecting the Plan Processor and when approving the Technical Specifications, and as a result could act much more quickly and at a potentially lower cost than if solutions were specified in the Plan.²⁹³⁴ In addition, the Commission explained why specifying details in the Technical Specifications instead of the Plan could make the Plan more agile and efficient in its ability to upgrade and improve the CAT Systems quickly.

Several commenters sought to have certain definitions included in the Plan.²⁹³⁵ Two commenters sought to have the Plan amended to specify certain of the Technical Specifications.²⁹³⁶ Participants commented that incorporating Technical Specifications in the Plan itself would interfere with the development of these specifications by the Plan Processor, and that these items are better suited for the Technical Specifications than the Plan.²⁹³⁷ In a

²⁹³³ See Notice, supra note 5, at 30751

²⁹³⁴ Id.

²⁹³⁵ TR Letter at 9–10; FIF Letter at 95–96; SIFMA Letter at 6.

²⁹³⁶ TR Letter at 5; UnaVista Letter at 2; see also Bloomberg Letter at 6–7 (recommending that Section 6.3 of the Plan be amended to specify the use of a uniform, global, open, multi-asset identifier; suggesting one such identifier developed by the commenter).

²⁹³⁷ Response Letter I at 40.

similar context, Participants also stated that subjecting Technical Specifications to a full filing process with the Commission would introduce significant delays in the process of developing the Technical Specifications, but that matters that are sufficiently significant to require a change to the Plan would be subjected to Commission review.²⁹³⁸

The Commission believes that commenters' requests that certain items be defined in the Plan are an implicit assertion that the Plan strikes the wrong balance with respect to the tradeoff identified in the Notice. In the Notice, the Commission was willing to accept the uncertainty created through the lack of definitions, in exchange for the benefits of permitting the relevant parties the flexibility to adopt the definitions or technical specifications at a later date, when the optimal approach to those issues might be more apparent, along with the flexibility to readily make changes to those items if challenges arise. By requesting that definitions or technical specifications be moved to the Plan, commenters advocate the opposite position: that it is acceptable to risk an inefficient definition in the Technical Specifications now, or to encounter delay or difficulty in changing it later, in exchange for added certainty in the definition or specifications as a part of the Plan approval process. The Commission disagrees. Given the technical nature of the technical specifications, and that the Plan does specify certain minimum standards that provide a floor and therefore certainty with respect to at least certain of the definitions and specifications, the Commission continues to believe that the existing process appropriately balances the need for certainty with the benefits of a flexible process going forward.

²⁹³⁸ Id. at 42.

(3) Implementation Efficiency

In the Notice, the Commission recognized that provisions of the Plan should also promote efficiently implementing expansions to the CAT Data.²⁹³⁹ Appendix C of the Plan notes that the Plan Processor must ensure that the Central Repository’s technical infrastructure is scalable and adaptable.²⁹⁴⁰ The Commission explained that these provisions should reduce the costs and time needed for expansions to the Central Repository.

Two commenters provided information relevant for the Commission’s analysis of the efficiency of the initial implementation of the Plan more broadly.²⁹⁴¹ In particular, the commenters expressed concerns that the timeline for implementation, including the testing and publication and iterative reviews of the Technical Specifications, would not allow for efficient implementation, potentially affecting the quality of the data coming to CAT from the beginning of its operations.²⁹⁴² One commenter stated that building in additional capacity and flexibility to expand CAT further over time will increase the scope of efficiencies and ancillary benefits, including long-term cost reductions, even if that additional capacity and flexibility are not

²⁹³⁹ See Notice, supra note 5, at 30751.

²⁹⁴⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section A.5(a).

²⁹⁴¹ SIFMA Letter at 23–24; FIF Letter at 37 (requesting two iterative reviews of order data and customer information specifications before implementation; noting that the 5 months allotted between the production of the customer information specification and implementation for large industry members is similarly insufficient to permit development and testing of a complex new function).

²⁹⁴² Id. Per one commenter, an aggressive timeline that results in “[r]ushing to achieve artificial milestones established without knowledge of the development effort involved, or even the full functionality to be delivered, will only result in poorly built systems, inferior quality of data reporting, missed and delayed schedules and cost overruns, for the Plan Processor, the regulators and the broker-dealer community.” See also FIF Letter at 36.

absolutely necessary to meet minimum Plan requirements.²⁹⁴³ Other commenters asserted that the Plan Processor selection should occur before Commission approval of the Plan, because the selection could negate a significant amount of uncertainty regarding the ultimate effects of the Plan.²⁹⁴⁴

Participants responded to the technical specifications point by stating that they recognize the benefit of iterative interactions between broker-dealers and the Plan Processor in terms of developing and executing final system specifications, which is why Appendix C of the Plan calls for the publication of iterative drafts, as necessary.²⁹⁴⁵ Participants responded to the comments regarding acceleration of Plan Processor selection by indicating that it would be infeasible to do so from a timing perspective; that the requirements of the CAT could change up until the point the Plan is approved, which could affect the selection process; and that selection is to be performed within two months of Plan effectiveness in any event.²⁹⁴⁶

The Commission considered the comments and the Participants' responses and now recognizes that the timeline for implementation can affect the efficiency of the initial implementation of the Plan. The timeline for implementation in the Plan includes a requirement for the Plan Processor to develop the Technical Specifications by publishing iterative drafts, as needed, and to publish the Technical Specifications one year before Industry Members are

²⁹⁴³ SIFMA Letter at 5–6. The commenter mentioned that such additional capacity and flexibility could be in the form of information, products, or functionality.

²⁹⁴⁴ TR Letter at 4; see also FSR Letter at 10 (recommending “acceleration of the Plan Processor selection process” in order to begin moving forward with formulation of technical specifications; “the release of final technical specifications should drive the implementation timeline”).

²⁹⁴⁵ Response Letter I at 41.

²⁹⁴⁶ Response Letter I at 52.

required to begin reporting data to the Central Repository, and to commence testing of connectivity and acceptance three months before Industry Members begin reporting data to the Central Repository.²⁹⁴⁷ The Plan has also been amended to require that the development of the Technical Specifications will begin no later than fifteen months before Industry Member reporting commences. Furthermore, the Plan has been amended to require that the CAT testing environment will be made available to Industry Members on a voluntary basis no later than six months prior to when Industry Members are required to report and that more coordinated, structured testing of the CAT system will begin no later than three months prior to when Industry Members are required to report data to CAT.²⁹⁴⁸

The Commission believes that the modification to the Plan requiring development of Technical Specifications at least 15 months before reporting begins will ensure more advance notice to the Participants about specific functionalities of CAT, and that this could potentially mitigate inefficiency in the implementation of the Plan. Moreover, modifications to the Plan requiring that the CAT testing environment be made available to Industry Members before they begin reporting will provide additional time for Industry Members to test their reporting procedures for the CAT System prior to implementation. They will also further mitigate inefficiencies related to the implementation of the Plan.²⁹⁴⁹ Further, as explained below, the Commission understands that the Bids of the three remaining Bidders propose accepting existing

²⁹⁴⁷ See CAT NMS Plan, supra note 5, at Appendix C, Section C.10.

²⁹⁴⁸ See Section IV.D.8.a, supra.

²⁹⁴⁹ See Section IV.D.8, supra, for further discussion of the comments regarding implementation and the Commission's response.

messaging protocols (e.g., FIX), rather than requiring CAT Reporters to use a new format.²⁹⁵⁰

This reduces some of the uncertainty regarding implementation times because CAT Reporters may not need to build new systems to report data to the Central Repository.

In response to the comment on building in additional capacity and flexibilities to expand further over time, the Commission believes that this comment is consistent with its analysis in the Notice that ensuring that the Central Repository's technical infrastructure is scalable and adaptable should reduce the costs and time needed for future expansions. Further, the Commission believes that provisions in the Plan already address this issue.²⁹⁵¹

With respect to accelerating the selection of the Plan Processor, this could trade one potential inefficiency for another: whereas there could be greater certainty about the effects of the Plan by locking in certain choices in advance, locking in those choices could result in inefficiencies if modifications to the Plan in the approval process change the Plan Processor selection. As inefficiencies in the choice of the Plan Processor could persist for the length of the Plan Processor's tenure, the Commission believes selecting the Plan Processor a short number of months after the approval of the Plan balances the need for expeditiously moving forward with implementation choices to provide sufficient time for implementation with the need to select the Plan Processor best positioned to achieve the regulatory benefits of the Plan.

b. Selection and Removal of the Plan Processor

In the Notice, the Commission discussed the CAT NMS Plan's use of an "RFP" to select the Plan Processor that would design, build, and operate the Central Repository.²⁹⁵² The winning

²⁹⁵⁰ See Section V.H.12.b, supra.

²⁹⁵¹ See Section IV.D.15, supra, for further discussion of scalability of the Plan.

²⁹⁵² See Notice, supra note 5, at 30751

bidder becomes the sole supplier of the operation of the Central Repository. The Commission stated its preliminary belief that this structure is necessary to achieve the benefits of a single consolidated source of regulatory data, but that the competitiveness of the selection process would thus influence the ultimate economic effect of the Plan.²⁹⁵³ The Commission further stated its preliminary belief that the selection process generally promotes competition, but that there are also a few potential limits on competition.²⁹⁵⁴ With respect to the Plan Processor's behavior following selection, the Commission stated its preliminary belief that the threat of replacement of the Plan Processor could incentivize it to set costs and performance competitively, but that the high cost of replacing the Plan Processor could limit these incentives.²⁹⁵⁵ These are discussed further below.

(1) Competitiveness of the Plan Processor Selection Process

In the Notice, the Commission stated its belief that two elements determine the competitiveness of the bidding process: the voting process and the degree of transparency in the bidding process. The Commission discussed its preliminary belief that the Plan provisions relevant to these two factors could promote competition in the bidding process and limit the risk that the selection of the Plan Processor would be affected by a conflict of interest, thereby promoting better decision-making.²⁹⁵⁶ Specifically, the Commission noted that, in the voting process, there is “a residual risk in having an SRO among the bidders; it is possible that voting

²⁹⁵³ Id. It would do so because the “effects depend in large part on the efficiency and effectiveness of the Plan Processor.” Id.

²⁹⁵⁴ Id.

²⁹⁵⁵ Id. at 30752.

²⁹⁵⁶ Id.

Participants would be biased for or against that SRO because they compete with that SRO in another market (and could gain a competitive advantage in that market by acting as Plan Processor) or because of repeated interactions with that SRO.”²⁹⁵⁷ Moreover, the Commission noted that “to the extent the Operating Committee has specific preferred solutions as to how the Plan should be implemented, the degree to which the Committee is transparent about those preferences in the bidding process would affect the competitiveness of that process”—but that “[t]he Commission has no reason to believe that the Operating Committee has preferred solutions beyond what is in the Plan that would significantly impact the competitiveness of the Plan Processor selection process.”²⁹⁵⁸

One commenter stated that, rather than a competitive process for selection of the Plan Processor, the selection of FINRA would best promote efficiencies, as it appears to have the required technology mostly in place, or can easily adapt existing technology to CAT’s requirements; it already deals with the CAT Data; and it already regulates broker-dealers and ATSS that will submit data to the CAT.²⁹⁵⁹ The Participants responded that completing the competitive process is most likely to promote an innovative and efficient CAT solution.²⁹⁶⁰

In the Commission’s view, a competitive process for the selection of the Plan Processor is most likely to lead to the best outcome for the CAT. The commenter has raised a number of reasons why FINRA’s bid may be the most persuasive. However, different approaches embodied in different bids would be expected to embody different tradeoffs. These tradeoffs can

²⁹⁵⁷ Id.

²⁹⁵⁸ Id.

²⁹⁵⁹ Anonymous Letter I at 1, 19–20.

²⁹⁶⁰ Response Letter I at 52.

be considered as part of a competitive bidding process, with the best bid chosen in the end. The Commission believes that completing the competitive bidding process is most likely to result in a CAT system that best balances cost, benefits, and efficiencies.

(2) Competitive Incentives of the Selected Plan Processor

In the Notice, the Commission discussed how the Plan could create competitive incentives for the selected Plan Processor by detailing strong requirements for the Plan Processor and providing an efficient mechanism to remove the selected Plan Processor and introduce an alternative Plan Processor in the event of underperformance. Here, the Commission stated its preliminary belief that the Plan provides the selected Plan Processor with competitive incentives because the Plan contains defined procedures for monitoring and removing the Plan Processor for failure to perform functions or otherwise. While removal for performance that is not “reasonably acceptable” is by Majority Vote of the Operating Committee, assessing the Plan Processor’s performance and demonstrating failings may be difficult; if that standard is not met, then removal is by Supermajority Vote, which may be more challenging to attain. The degree of difficulty of removal thus could limit the Plan Processor’s competitive incentives. Similarly, the potentially extensive costs of switching to another Plan Processor (including selection of a new Plan Processor, which could potentially require rebuilding the Central Repository and implementation of new Technical Specifications) could limit competitive incentives.²⁹⁶¹

²⁹⁶¹ See Notice, supra note 5, at 30752–53. Specifically, with regard to removal, the Commission noted that “[t]he Plan contains several provisions that would allow the Operating Committee to remove the Plan Processor”—including in specified circumstances by “only a Majority Vote” which “incentivizes the Plan Processor to perform well enough to avoid being removed” but that it “depend[s] significantly on strong oversight by the Operating Committee.” Id. at 30753. However, the Commission also noted that it “recognizes that the effort required to remove a Plan Processor could be

One commenter expressed a view that the continuing incentives of the Plan Processor are a legitimate concern, and that the contract with the Plan Processor should be rebid every 5 years, because it would “prevent the stagnation of the CAT system and encourage innovation” and “force the SEC to re-evaluate the performance of the system and the Plan Processor at least periodically, with the benefit of public input.”²⁹⁶² The Participants responded by asserting that the Operating Committee will be reviewing Plan Processor performance, and may remove the Plan Processor by Supermajority Vote at any time, or by a Majority Vote where the Plan Processor has failed to reasonably perform its obligations.²⁹⁶³

The Commission has considered the views of the commenter on the competitive incentives of the Plan Processor and continues to believe that the Plan provides competitive incentives to control costs and promote the performance of the Plan. The commenter did not provide any additional information or analysis that the Commission believes would warrant changes to its analysis, nor does the Commission believe that the modifications to the Plan warrant changes to this aspect of the economic analysis. With respect to the comment that suggested rebidding every 5 years, the Commission agrees that a rebidding process after some period of time could provide a focal point for determining whether other technologies or other entities could be preferable to the incumbent Plan Processor. However, the existing provisions for removing a Plan Processor in the event of underperformance, and the existing authority of the

significant” and that “significant switching costs could influence whether removing a Plan Processor despite poor performance makes economic sense”—such that “the Plan Processor may only need to perform well enough to keep the inefficiencies associated with their performance from exceeding the cost to switch to another Plan Processor.” *Id.*

²⁹⁶² Better Markets Letter at 7.

²⁹⁶³ Response Letter I at 52.

Commission to oversee the CAT NMS Plan, already provide some incentives for continuous CAT innovation and cost reductions. Moreover, a bidding process is not a costless exercise; it requires hundreds or thousands of hours of work on the part of bidders to prepare and submit bids, and Plan Participants to review bids. Additionally, it is not clear whether the rebidding process sought by the commenter would consider the costs to switch as part of the incumbent's bid (in which case it would significantly advantage the incumbent), or would consider bids without reference to incumbency (which could result in the imposition of inefficient costs if the benefits of the new Plan Processor do not exceed the costs to switch).

H. Alternatives

As part of its economic analysis, the Commission has considered the likely economic effects of a number of alternatives to the approaches taken in the CAT NMS Plan as amended. In the Notice, the Commission analyzed alternatives that could have a direct and significant impact on costs or benefits deriving from at least one of the four data qualities discussed above: accuracy, completeness, accessibility, and timeliness.²⁹⁶⁴

The Commission has considered the comments received on the alternatives discussed in the Notice, and continues to believe that the likely economic effects of the alternatives will be consistent with the preliminary conclusions set out therein, except where noted below.²⁹⁶⁵ In several instances, the Commission did not receive any comments that disagreed with its analysis of the likely costs and benefits of a particular alternative, and the approach taken in the Plan with respect to these alternatives is consistent with the Commission's analysis. Where that is the case, the Commission has not discussed the alternative in this Order, and instead relies on the analysis

²⁹⁶⁴ See Notice, supra note 5, at 30754–76.

²⁹⁶⁵ Id.

in the Notice. These alternatives include: requiring both Options Market Makers and Options Exchanges to report Options Market Maker quotations to the Central Repository; requiring CAT Reporters to report a unique Customer-ID for each Customer upon the original receipt or origination of an order; requiring CAT Reporters to report a universal CAT-Reporter-ID to the Central Repository for orders and certain Reportable Events; excluding the requirement to report Customer-IDs; excluding the requirement to report CAT-Reporter-IDs when a routed order is received; alternative intake capacity levels; data accessibility standards, and the exclusion of OTC Equity Securities.

Where commenters disagreed with Commission with respect to its analysis of an alternative approach, the Commission discusses the comments below and considers whether any changes are warranted to the Commission's analysis and conclusions. Where commenters agreed with the Commission's analysis, but the Plan's approach differs in some respect from the approach discussed by the Commission and the commenters, the Commission summarizes its analysis and the comments received, below. Where a Plan modification supersedes the alternatives discussed in the Notice, the Commission considers comments on those alternatives in the discussion of the costs and benefits of the Plan, above.

The Commission notes that some commenters also raised reasonable potential alternatives not discussed by the Commission in the Notice. If the Plan modifications do not incorporate the suggestions and the comment does not provide sufficient information for a fulsome economic analysis, the Commission responds to those comments above in the Discussion Section. If Plan modifications incorporate those suggestions, the Commission discusses the updates to its economic analysis to recognize the modification in the discussion of the costs and benefits of the Plan, above, and considers the points made by commenters

therein.²⁹⁶⁶ If the Plan modifications do not incorporate the suggestions and the comment does provide sufficient information for an analysis of the economic effects of the alternative, the Commission discusses the alternative below.

1. Timestamp Granularity

In the Notice, the Commission solicited comment on the benefits and costs of an alternative timestamp granularity requirement of less than one millisecond.²⁹⁶⁷ The Commission's preliminary analysis of alternative clock offset tolerance requirements suggested that millisecond timestamps may be inadequate to allow sequencing of the majority of unrelated Reportable Events across markets.²⁹⁶⁸ In addition, the Commission recognized that sub-millisecond timestamp reporting would bring certain benefits, but the benefits would be limited unless the Plan were to require a clock offset tolerance far lower than is proposed in the Plan. The Commission also recognized that implementation costs of sub-millisecond timestamps would likely vary across CAT Reporters, but such a requirement is unlikely to create significant additional costs for CAT Reporters.

Four commenters addressed this alternative. Three were supportive of the Plan, and one was supportive of the alternative.²⁹⁶⁹ The commenters that supported the Plan generally indicated that one millisecond timestamps should be sufficient to sequence events.²⁹⁷⁰ One of

²⁹⁶⁶ See Section IV., supra.

²⁹⁶⁷ See Notice, supra note 5, at 30764–65.

²⁹⁶⁸ See Notice, supra note 5, at Section IV.E.1.b(2)B.

²⁹⁶⁹ FIF Letter at 112; SIFMA Letter at 34–35; Better Markets Letter at 8; Data Boiler Letter at 21.

²⁹⁷⁰ FIF Letter at 112; SIFMA Letter at 34–35; Data Boiler Letter at 21. FIF provided additional insight into event sequencing possibilities.

these commenters added that it would be very difficult, costly, and disruptive to change the timestamp granularity for broker-dealers and would involve expanding database fields, expanding application interfaces, logging files and managing to a clock offset lower than 50 milliseconds.²⁹⁷¹ This commenter focused primarily on broker-dealers while noting that exchanges already have more granular timestamps.²⁹⁷² Another commenter that supported the millisecond standard in the Plan stated it was “okay” to require this standard, but added, “if certain categories of market participants can originate, modify, cancel, route, execute[,] trade, and/or allocate an order in substantially less than one millisecond, then they should record and report the time of each reportable event using timestamps reflecting their sub-millisecond or microsecond processing capability.”²⁹⁷³ The final commenter that supported the millisecond standard disagreed that CAT Reporters should be required to report more granular timestamps when the Reporter captures that level of detail in its normal practice. The commenter stated that such reporting would require changes to all layers of servers, software and databases between the point of timestamp capture to the final CAT reporting layer, and would be unnecessarily expensive.²⁹⁷⁴ The commenter supporting more granular timestamps stated that there would be benefits in certain circumstances, stating that the Plan’s timestamp resolution “will be insufficient to show the precise time of the reportable activities” and “[f]or some practices, such as cancellations, stuffing, and other “noisy” behaviors ... the Commission should require a more

²⁹⁷¹ FIF Letter at 112.

²⁹⁷² FIF Letter at 112.

²⁹⁷³ Data Boiler Letter at 21.

²⁹⁷⁴ SIFMA Letter at 35.

precise granularity to more comprehensibly and accurately capture the frequency and scale of such practices.”²⁹⁷⁵

In their response to the comment on the costs of requiring more granular timestamps when the Reporter captures that level of detail in its normal practice, the Participants stated their belief that as additional CAT Reporters capture timestamps that are more granular than that required by the Plan, the quality of data reported to the CAT will increase correspondingly.²⁹⁷⁶

The Commission considered these comments and the Participants’ response and now believes that the costs of requiring sub-millisecond timestamps could be significant for some broker-dealers, and also across broker-dealers, because the broker-dealer industry does not broadly apply sub-millisecond timestamps. In response to the commenters that stated that exchanges and certain other categories of market participants already may be capable of sub-millisecond timestamps,²⁹⁷⁷ the Commission notes that if a CAT Reporter uses timestamps in increments finer than milliseconds, that CAT Reporter must use those finer increments when reporting to the Central Repository.²⁹⁷⁸ Therefore, the Central Repository will capture finer timestamps in those cases. In response to the commenter who stated that the reporting of finer timestamps would be unnecessarily expensive for those Reporters who choose to capture finer timestamps, the Commission agrees that some Reporters may need to update their reporting systems to report these finer timestamps and therefore may incur additional costs. However, it is unclear to the Commission, and it was left unspecified by the commenter, how many CAT

²⁹⁷⁵ Better Markets Letter at 8.

²⁹⁷⁶ Response Letter I at 28-29.

²⁹⁷⁷ FIF Letter at 112; Data Boiler Letter at 21.

²⁹⁷⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section A.3(c).

Reporters would need to update their systems and furthermore whether these Reporters would already be updating their systems in response to the Plan’s millisecond reporting standard, so that only incremental costs above this standard should be considered. Finally, the Commission agrees with the Participants’ stated view that the Plan provides for the quality of CAT Data to improve as CAT Reporters use more granular timestamps.²⁹⁷⁹ However, because the broker-dealer industry does not broadly apply sub-millisecond timestamps, many CAT Reporters will use timestamps to the millisecond, and the Commission continues to believe that millisecond timestamps may be inadequate to allow sequencing of the majority of unrelated Reportable Events. The commenters supporting the Plan either state that one millisecond is “okay” or state that it is not possible to sequence “all” events regardless of timestamp granularity. The Commission acknowledges that seeking to sequence “all” unrelated Reportable Events may not be possible, but maintains, as discussed in the Notice,²⁹⁸⁰ that a sub-millisecond timestamp could improve the ability to sequence the majority of orders, subject to limitations from the clock synchronization standard. However, the Commission is approving the Plan without modifying the requirements for timestamp granularity for the reasons discussed in Section IV.D.13, above.

2. Error Rate

In the Notice, the Commission solicited comments on the benefits and costs of alternative maximum Error Rates.²⁹⁸¹ While the Commission believed that most regulatory uses would involve data after T+5, the Commission noted that regulators also have essential needs for uncorrected data prior to T+5. Therefore, a lower Error Rate in data available before T+5 could,

²⁹⁷⁹ Response Letter I at 29.

²⁹⁸⁰ See Notice supra note 5, at 30684–85.

²⁹⁸¹ Id. at 30765–66.

in certain regulatory contexts, be meaningful. Additionally, because OATS currently has a lower observed error rate than the rate in the CAT NMS Plan, a reduction in CAT Error Rates may accelerate the retirement of OATS. Further, the Commission noted that reducing Error Rates could increase the implementation and ongoing costs incurred by CAT Reporters and the Central Repository as compared to costs estimated in the Plan.

The Commission received five comments on the level of the error rates.²⁹⁸² Two commenters supported the CAT NMS Plan’s initial maximum Error Rate of 5% for CAT Data reported to the Central Repository.²⁹⁸³ One of these commenters stated, “the proposed initial maximum error rate provides the appropriate level [of] flexibility while ensuring the data will be capable of being used to conduct market reconstruction.”²⁹⁸⁴ One of the commenters that supported the Plan’s error rates conditioned the support on measuring the error rate using post-correction errors, but provided no explanation for the condition.²⁹⁸⁵ Another commenter that supported measuring the error rate post-correction stated the alignment of interests—the reporters would have an interest in the quality of the data most important to regulatory activities—but supported a “de minimis” error rate goal over time, indicating that uncertainty prevents the ability to predict when the Plan could achieve that goal.²⁹⁸⁶ This commenter further stated that there are cost tradeoffs that CAT Reporters face when attempting to reduce their error rates. The commenter mentioned several methods that would increase the cost of

²⁹⁸² FSR Letter at 9; UnaVista Letter at 3–4; SIFMA Letter at 6; FIF Letter at 50; Better Markets Letter at 9.

²⁹⁸³ FSR Letter at 9; UnaVista Letter at 3–4.

²⁹⁸⁴ UnaVista Letter at 3.

²⁹⁸⁵ FSR Letter at 9.

²⁹⁸⁶ FIF Letter at 51–52.

implementation but that should decrease the overall yearly reporting cost for a Reporter and stated that Reporters will choose different approaches for correcting errors.²⁹⁸⁷

One commenter opposed the error rates in the Plan, arguing that they are too high,²⁹⁸⁸ while the other two commenters expressed significant uncertainty associated with assessing the appropriate error rates.²⁹⁸⁹ The commenter opposing the error rates in the Plan cited the industry's experience with OATS, while the commenters expressing uncertainty cited a lack of experience with reporting certain types of data (options, market making, customer information, and allocations)²⁹⁹⁰ or by certain types of reporters (those with no regulatory reporting experience),²⁹⁹¹ steep learning curves to new reporting,²⁹⁹² and a lack of information in the Plan about the definition of an error and how it will be corrected.²⁹⁹³

Several commenters seemed to agree with the Commission that the error rates are important to retirement of duplicative systems, but that the specific error rate that could accelerate retirement is unknown.²⁹⁹⁴ However, another commenter did not think that error rates should have a direct impact on system retirement.²⁹⁹⁵

Finally, one commenter opposed having different error rates for different types of CAT Reporters, stating that the Notice provided no compelling reason for excusing Small Industry

²⁹⁸⁷ FIF Letter at 55-56.

²⁹⁸⁸ Better Markets Letter at 9.

²⁹⁸⁹ SIFMA Letter at 6; FIF Letter at 50.

²⁹⁹⁰ FIF Letter at 50.

²⁹⁹¹ FIF Letter at 50.

²⁹⁹² SIFMA Letter at 6.

²⁹⁹³ SIFMA Letter at 6; FIF Letter at 50.

²⁹⁹⁴ SIFMA Letter at 6; FIF Letter at 50.

²⁹⁹⁵ UnaVista Letter at 3.

Members from error rate requirements for the first two years while expressing an expectation that these reporters will account for a “massive amount of data.”²⁹⁹⁶

The Commission has considered these comments and acknowledges the significant uncertainty associated with the determination of an appropriate Maximum Error Rate, as identified by commenters.²⁹⁹⁷ This uncertainty arises from the fact that the Plan requires the reporting of certain types of data that are not currently reported, the Plan requires reporting by certain participants that do not have experience with such reporting requirements, and the Plan has a lack of information about the definition of an error and how it will be corrected. The Commission notes, however, that provisions of the Plan could allow adjustment of error rates as more information becomes available, particularly during testing, and that adjustments could be up or down depending on the results of this testing.

In response to the commenter that suggested that the maximum error rate in the Plan should be lower and cited the industry’s experience with OATS,²⁹⁹⁸ the Commission reiterates what was mentioned in other comment letters and discussed above, that CAT reporting involves reporting certain types of data not currently reported and requires reporting by certain market participants that do not have experience with such reporting requirements, so that experience with OATS may not be applicable for CAT reporting. Therefore, the Commission continues to believe that reducing Error Rates in the Plan could increase the implementation and ongoing costs incurred by CAT Reporters and the Central Repository as compared to costs estimated in the Plan.

²⁹⁹⁶ Better Markets Letter at 9.

²⁹⁹⁷ SIFMA Letter at 6; FIF Letter at 50.

²⁹⁹⁸ Better Markets Letter at 9.

The Commission agrees with commenters who indicated the need to tie error rates to retirement of duplicative systems. The Commission believes that regulators may find it advantageous to retain other systems until CAT Data is at least as accurate as those systems, and therefore continues to believe that reducing the maximum error rate could accelerate their retirement. However, the CAT NMS Plan does not require a particular target Error Rate before other systems can be retired, so the Commission continues to be unable to assess the benefits of specific maximum error rates as they relate to system retirement.

In response to the comments suggesting that the Plan focus only on post-correction error rates, the Commission agrees that the post-correction error rates, which the Plan states will be de minimis, are most important to data quality, but retains the belief that lower pre-correction error rates could be meaningful. This is because, as discussed in the Notice, regulators also have essential needs for uncorrected data prior to T+5, although the Commission believes that most regulatory uses would involve data after T+5.

With respect to the comment that expressed concern that if small broker-dealers voluntarily report to CAT during the first two years of CAT operations, then the utility of CAT will be diminished because they would be permitted to report with limitless errors,²⁹⁹⁹ the Commission disagrees with this interpretation of the CAT NMS Plan, as discussed above because the Maximum Error Rate would apply to anyone reporting to CAT, whether mandated to do so in accordance with the CAT NMS Plan or voluntarily.³⁰⁰⁰

²⁹⁹⁹ Better Markets Letter at 9.

³⁰⁰⁰ See Section IV.D.10., supra.

3. Error Correction Timeline

In the Notice, the Commission solicited comment on an alternative error correction timeline to that proposed in the CAT NMS Plan.³⁰⁰¹ The CAT NMS Plan includes a deadline of T+3 for submission of corrected data to the Central Repository.³⁰⁰² The CAT NMS Plan also discusses recommendations from Financial Information Forum and SIFMA to impose an alternative T+5 deadline.³⁰⁰³ The Participants state in the CAT NMS Plan that they believe it is important to retain the T+3 deadline in order to make data available to regulators as soon as possible.³⁰⁰⁴

In the Notice, the Commission solicited comment on whether the CAT NMS Plan should impose a T+5 deadline for the submission of corrected data rather than the T+3 deadline. The Commission preliminarily believed that the delays in regulatory access from a T+5 deadline would reduce regulators' ability to conduct surveillance and slow the response to market events relative to the CAT NMS Plan. At the same time, the Commission also believed that T+5 error correction might reduce costs to industry relative to the CAT NMS Plan, although the Commission was not aware of any existing cost estimates.³⁰⁰⁵

³⁰⁰¹ See Notice, supra note 5, at 30766.

³⁰⁰² See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(a)(iv).

³⁰⁰³ Id. In earlier comment letters submitted to the Participants, FIF and SIFMA maintained that the T+3 deadline may not be feasible and would prove costly to market participants. See Letter from Manisha Kimmel, Managing Director, FIF, to the Participants, dated November 19, 2014, available at <http://www.catnmsplan.com/industryfeedback/p601972.pdf>; Industry Recommendations for the Creation of a Consolidated Audit Trail (CAT), SIFMA, March 28, 2013, available at <http://www.catnmsplan.com/industryfeedback/p242319.pdf>.

³⁰⁰⁴ See CAT NMS Plan, supra note 5, at Appendix C, Section A.1(a)(iv).

³⁰⁰⁵ See Notice, supra note 5, at 30766.

Two commenters disagreed with the T+3 error correction deadline proposed in the Plan.³⁰⁰⁶ One of the commenters noted that the T+3 deadline “appears too aggressive at this time,” because “the fact that roll-out of the CAT will include a sharp learning curve for broker-dealers and regulators as they understand and absorb the intricacies of [a] new and complex system such as the CAT.” The commenter further stated that “the CAT NMS Plan should be amended to maintain current error correction timeframes until CAT reporting errors are analyzed and better understood by broker-dealers and exchanges, and regulators.”³⁰⁰⁷

Likewise, the second commenter maintained that the T+3 deadline may not be achievable until “the CAT system and its support infrastructure can be proven stable, ... a body of supporting documentation ... can be developed and absorbed by the CAT Reporters”, and CAT reporting errors are analyzed and better understood.³⁰⁰⁸ The commenter suggested that the current OATS approach, under which firms have five days from the date they receive notice of the error to submit a correction, should be kept in place for the first year of CAT reporting for each group of CAT Reporters. The commenter noted that “a less aggressive, measured approach towards reduction in the error correction timeframe over time will produce better quality results, with less overall cost to the industry than the proposed approach.”³⁰⁰⁹ Under this commenter’s suggested approach, the deadline for the submission of corrected data would be 8:00am on T+6,

³⁰⁰⁶ FIF Letter at 3, 9, 52–53; KCG Letter at 9.

³⁰⁰⁷ KCG Letter at 9.

³⁰⁰⁸ FIF Letter at 52.

³⁰⁰⁹ FIF Letter at 53.

with corrected data available to regulators by 8:00am on T+8, consistent with the current OATS approach.³⁰¹⁰ One commenter stated that the current approach was “feasible.”³⁰¹¹

In their response, the Participants stated that they believe that the prompt availability of corrected data is “imperative to the utility of the Central Repository,” and that the three-day error correction period “appropriately balances the need for regulators to access corrected data in a timely manner while taking into consideration the industry’s concerns.”³⁰¹² The Participants acknowledged that a five-day window for error correction is used for OATS reporting currently, but stated their belief that the window in the Plan would allow for better regulatory surveillance and market oversight.³⁰¹³ The Participants also stated that, based on a review of OATS data from August 2016, most errors reported to OATS were corrected within six business days of submission (approximately 91.26% of error corrections), with 26.46% of error corrections occurring one day after submission, and 59.45% of error corrections occurring six days after submission (i.e., on the rejection repair deadline).³⁰¹⁴ Additionally, approximately 0.48% of error corrections were made on the day of submission, approximately 4.86% of error corrections were made two to five days after submission, and the remaining approximately 8.75% of error corrections were made seven to 36 days after submission.³⁰¹⁵

³⁰¹⁰ FIF Letter at 59–60.

³⁰¹¹ UnaVista Letter at 4.

³⁰¹² Response Letter I at 30.

³⁰¹³ Response Letter I at 30.

³⁰¹⁴ Response Letter III at 13. The letter states that the percentages were determined by FINRA based on a review of OATS data from August 2016.

³⁰¹⁵ Response Letter III at 13.

The Commission has considered the comments it received on whether the CAT NMS Plan should impose a T+5 deadline for the submission of corrected data, rather than the T+3 deadline, as well as the Participants' response.

The Commission recognizes that broker-dealers and regulators may face a learning curve as they adjust from the current OATS approach, under which firms have five days from the date they receive notice of the error to submit a correction, to the T+3 error correction deadline imposed by the Plan, which will allow firms approximately two days from the date they receive notice of the error to submit the correction.³⁰¹⁶ The Commission also recognizes that a T+5 deadline may be easier to achieve than the T+3 deadline, and therefore may be less costly. The Commission notes that, while the data provided by the Participants indicates that approximately 26% of error corrections currently are made on T+1, approximately 59% of OATS error corrections are currently made on T+6, the last day of the OATS error correction period, indicating that many OATS reporters will likely be required to change their error correction practices to achieve the T+3 deadline in the Plan. The Commission also recognizes that keeping a deadline of T+5 for the first year of CAT reporting for each group of CAT Reporters may potentially improve the quality of CAT Data during that year. However, the Commission believes that a T+5 deadline would reduce the timeliness benefits of the Plan by delaying regulatory access to CAT Data during that year. The Commission continues to believe that the delays in regulatory access from a T+5 deadline would reduce regulators' ability to conduct surveillance and slow the response to market events relative to the CAT NMS Plan, and would

³⁰¹⁶ Under the Plan's approach, the deadline for the Plan Processor to validate customer data and generate error reports is 5:00 p.m. on T+1, and the deadline for the submission of corrected data is 8:00 a.m. ET on T+3. See Appendix C, Section A.1(a)(iv).

largely negate the timeliness benefits discussed above in connection with the error correction timeline.³⁰¹⁷

4. Requiring Listing Exchange Symbology

In the Notice, the Commission solicited comment on an alternative to the CAT NMS Plan that would allow CAT Reporters to report using their existing symbologies, rather than listing exchange symbology.³⁰¹⁸ The Commission discussed its preliminary belief that, in light of the requirement for the Plan Processor to maintain a complete symbology database, the requirement that CAT Reporters report using listing exchange symbology may result in unnecessary costs to CAT Reporters. Therefore, the Commission preliminarily believed that the alternative of allowing CAT Reporters to use their existing symbologies for reporting purposes could significantly reduce the costs for exchanges and broker-dealers to report order events to the Central Repository, as compared to the approach in the CAT NMS Plan, without a significant impact on the expected benefits of the Plan or the costs to operate the Central Repository.

The Commission received three comments relevant to this alternative. One commenter stated that, “in order to minimize cost and invasiveness to the industry,” the Central Repository should accept existing symbology “as-is” rather than requiring listing exchange symbology.³⁰¹⁹ Another commenter stated that using listing exchange symbology was costly not only for equities, as discussed in the Notice,³⁰²⁰ but also for options.³⁰²¹ The final commenter stated that,

³⁰¹⁷ See Section V.E.1.d, supra (noting that corrected OATS data is currently available to FINRA by T+8, and that under the Plan, regulators will be able to access corrected CAT Data three days earlier).

³⁰¹⁸ See Notice, supra note 5, at 30769–70.

³⁰¹⁹ Data Boiler Letter at 37–38.

³⁰²⁰ See Notice, supra note 5, at 30730.

“it would be more efficient to have the Central Repository manage the mapping tables in one place, as it is less error prone... than to have all reporting broker-dealers mapping to their separate tables,”³⁰²² and that the use of existing symbology “does provide a data quality advantage.”³⁰²³ However, the commenter also stated that it did not expect the elimination of the requirement to use existing symbology to result in a large cost savings.³⁰²⁴ While the commenter did not explain why the cost savings would be minimal, as discussed in the Baseline Section above, the Participants’ response notes that broker-dealers currently use listing exchange symbology to report to OATS and existing messaging protocols do not necessarily use a standard symbology. Therefore, in the absence of such a requirement, CAT reporters might use “bespoke” symbologies to report that would be difficult for the Central Repository to map.

In the Participants’ response, the Participants stated their belief that the requirement for CAT Reporters to use listing exchange symbology “is the most efficient, cost-effective and least error prone approach to symbology,” and that based on discussions with the DAG, it is their understanding that “all Industry Members subject to OATS or EBS reporting requirements currently use the symbology of the listing exchange when submitting such reports.”³⁰²⁵ They further stated that allowing CAT Reporters to determine symbology would “require each CAT Reporter to submit regular mapping symbology information to the CAT, thereby increasing the

³⁰²¹ Bloomberg Letter at 5.

³⁰²² FIF Letter at 95.

³⁰²³ FIF Letter at 95.

³⁰²⁴ FIF Letter at 95.

³⁰²⁵ Response Letter II at 7.

complexity and likelihood for errors in the CAT.”³⁰²⁶ However, the Participants stated that they “understand that some industry messaging formats, such as some exchange binary formats, require symbology other than the primary listing exchange symbology,” and that in these and similar cases, the Participants recommended that the Plan be amended to permit the use of the required symbology.³⁰²⁷ The Participants also added that, based on their understanding of current practices, Industry Members currently employ technical solutions and/or systems that allow them to translate symbology in the correct format when submitting data to exchanges.³⁰²⁸

The Commission is revising its economic analysis of this alternative in light of the comments and the Participants’ response. While commenters generally agreed with the Commission’s analysis in the Notice, they seemed to indicate that the cost savings from a requirement to use existing symbology would not be large. Further, the additional baseline information in the Participants’ response also suggests that the cost savings might not be significant. The Commission’s analysis in the Notice hinged on the necessity of running an additional process on messaging protocol data prior to submitting the data. The Commission believed the cost savings and the data quality benefits would come from avoiding this additional process, which would need to be built and maintained and could add errors to the data. However, the Participants’ response indicates that existing messaging protocols may already have integrated processes that translate symbols efficiently and accurately prior to routing to an exchange. While the Participants’ response does not indicate that the messaging protocols translate symbols for other types of messages, the Commission presumes that the functionality

³⁰²⁶ Response Letter II at 7.

³⁰²⁷ Response Letter II at 7.

³⁰²⁸ Response Letter III at 13.

should be transferable to other message types, including order originations and routes to other broker-dealers. Because this functionality operates for business purposes, broker-dealers have a strong incentive to ensure its accuracy. Therefore, the Commission no longer believes that eliminating the requirement to translate symbols would improve accuracy and significantly reduce costs. In addition, the Commission now believes that eliminating the requirement could result in an additional cost to the Central Repository and a potential reduction in accuracy because it could involve having to map “bespoke” symbologies into one standardized symbology.

5. Clock Synchronization Logging Procedures

In the Notice, the Commission solicited comments on an alternative that would require logging only exceptions to the clock offset (i.e., events in which a market participant checks the clock offset and applies changes to the clock).³⁰²⁹ While logging every event, including clock offset checks, may be cost effective with longer clock synchronization tolerances, the Commission questioned whether logging each event is cost effective with finer clock offset tolerances, given the large number of events expected for the proposed and alternative clock synchronization standards. The Commission explained that it could not quantify the reduction in costs from this alternative because it lacked data on the proportion of clock synchronization costs that are associated with event logging and the proportion of those costs that could be avoided by alternative event logging requirements. The Commission discussed its preliminary belief that any reduction in benefits from this alternative, as compared to the CAT NMS Plan’s approach for clock synchronization, would be minor because the inclusion of clock synchronization checks

³⁰²⁹ See Notice, supra note 5, at 30764. This is one of the alternatives suggested in the FIF Clock Offset Survey. See supra note 247.

that required no clock adjustment would not improve regulators' ability to sequence events. The Commission noted, however, that enforcement of clock synchronization requirements could be more difficult without comprehensive logging requirements that document firms' actions to comply with requirements; consequently, relaxing the logging requirement could also reduce incentives to comply with the clock synchronization requirements.

As discussed above,³⁰³⁰ one commenter supported the alternative raised by the Commission that any requirement to maintain a log of clock synchronization events should only require logging of clock synchronization exceptions, not all clock synchronization events, noting that requiring logging of all events would be costly for some broker-dealers.³⁰³¹ However, the commenter did not provide any additional information that would allow the Commission to quantify the cost savings of logging only these events. Therefore, while the Commission continues to believe that there could be cost savings from logging only exceptions to the clock offset, the Commission remains unable to quantify the reduction in costs from this alternative. The Commission continues to believe that any reduction in benefits under this alternative approach would be minor, but that enforcement of clock synchronization requirements may be more difficult, which may reduce incentives to comply with the clock synchronization requirements.

6. Data Accessibility Standards

In the Notice, the Commission solicited comment on alternative approaches to the manner in which the CAT NMS Plan provides data access to regulators.³⁰³² The Commission

³⁰³⁰ See Section IV.D.13, *supra*.

³⁰³¹ FIF Letter at 108, 122.

³⁰³² See Notice, *supra* note 5, at 30770.

discussed the requirements for regulatory access to the Central Repository, explaining that the CAT NMS Plan could result in many improvements to regulatory activities such as surveillance, examinations, and enforcement, but that these benefits may not be fully realized if access to data is cumbersome or inefficient. The Commission solicited comment on each of the minimum data accessibility standards required in the Plan. The Commission also discussed several examples in particular, and requested comment on alternative standards that might be adopted in each case.

In the Notice, the Commission noted that the CAT NMS Plan requires query responses for various types of queries of 5 minutes, 10 minutes, 3 hours, and 24 hours, where the simplest queries involving scanning narrow sets of data would be required to return in 5 minutes and complex queries scanning multiple days of data and returning large datasets would be required to return within 24 hours. While the benefits of direct access to CAT Data depend on reasonably fast query responses, the Commission recognized that faster query response times come at a cost. The Commission stated that it did not have detailed information on significant breakpoints in those costs to judge whether slightly longer response times than those in the Plan could significantly reduce the costs of developing, maintaining, and operating the Central Repository. The Commission recognized that the detailed information on numerous other minimum standards regarding regulator access to CAT Data is similarly unclear. Therefore, the Commission requested comment regarding all standards for regulatory access and whether technology creates natural breakpoints in costs such that a particular alternative could reduce the costs of the Plan without significantly reducing benefits or could increase benefits without significantly increasing costs.

Commenters made a number of suggestions regarding data accessibility standards. One commenter stated that it was unclear whether the CAT would be able to support various types of

data analysis by regulators within the Central Repository, and noted that, without that ability, all of the analyses must be done outside of the CAT Repository and within the regulators' own infrastructure, which would require bulk extraction and could lead to increased costs and security concerns due to the need to store multiple copies of CAT Data with various SROs.³⁰³³ The commenter recommended that the Plan clearly specify the analytical capability requirements with respect to the Central Repository.³⁰³⁴ Another commenter recommended that the CAT support real-time ingestion, processing and surveillance, and that the CAT provide regulators with access to real-time analytics.³⁰³⁵ One commenter believed that the proposed model and timeframe for regulatory access is consistent with the Commission's regulatory objectives, but recommended the use of pre-defined extract templates and uniform global formats such as ISO 20022 to allow for exchange of data between both national and global regulators.³⁰³⁶ That commenter also suggested that there should be an ability for regulators to perform analyses within the CAT environment, and that there should be flexible search/filtering capabilities.³⁰³⁷

In their response, the Participants stated that, with respect to the analytical requirements of the Central Repository, they believe the details in the Plan are sufficient, and noted that Section 8 of Appendix D of the Plan describes various tools that will be used for surveillance and analytics. They also noted that it would be "counterproductive from a regulatory oversight perspective to provide significant detail regarding the surveillance processes of the

³⁰³³ SIFMA Letter at 33.

³⁰³⁴ SIFMA Letter at 33.

³⁰³⁵ Data Boiler Letter at 1, 10.

³⁰³⁶ UnaVista Letter at 4.

³⁰³⁷ UnaVista Letter at 4.

regulators.”³⁰³⁸ With respect to real-time ingestion, processing, surveillance, and analytics, the Participants noted that Rule 613 does not provide for real-time reporting.³⁰³⁹ With respect to pre-defined extract templates and uniform global formats, the Participants noted that the Plan requires data extracts to use common industry formats.³⁰⁴⁰ The Participants also stated that they expect that the requests from regulators other than those regulators permitted access to the CAT (such as foreign regulators and other U.S. government agencies) will be on an ad hoc basis pursuant to applicable information sharing agreements, and would be accommodated on a case-by-case basis.³⁰⁴¹

The Commission has considered the comments received and the Participants’ response. With respect to the suggestion that the Plan clearly specify the analytical capability requirements with respect to the Central Repository,³⁰⁴² the Commission notes that, while the Plan provides detail on the method of access and the type of queries that regulators could run, many of the decisions regarding access have been deferred until after the Plan Processor is selected and finalizes the Technical Specifications. In particular, as discussed in the Notice, the details of functionality and performance of the final system are still to be determined.³⁰⁴³ The Commission believes that an alternative approach that clearly specified the required analytical capabilities of the Central Repository would reduce the uncertainty with respect to the expected benefits of the Plan in terms of accessibility. However, the Commission does not have sufficient information to

³⁰³⁸ Response Letter I at 42.

³⁰³⁹ Response Letter I at 43.

³⁰⁴⁰ Response Letter I at 43.

³⁰⁴¹ Response Letter I at 43.

³⁰⁴² SIFMA Letter at 33.

³⁰⁴³ See Notice, supra note 5, at 30691.

estimate the costs of requiring the Central Repository to provide specific analytical capabilities, because the Commission lacks information on the costs of building those capabilities into the Central Repository as opposed to using outside servers.

The Commission does not agree with the commenter that stated that an approach requiring bulk extractions by regulators is likely to increase the Participants' costs significantly relative to an approach whereby regulators perform analyses within the Central Repository.³⁰⁴⁴ The Commission acknowledges that hosting large databases is costly, but it believes that SROs are likely to consider the cost implications when contemplating replicating large portions of the Central Repository within their IT infrastructure, and presumably will only replicate the data when it is efficient for them to do so.³⁰⁴⁵ In response to the commenter that stated that frequent bulk extractions of data by regulators may result in an increased security risk,³⁰⁴⁶ the Commission notes that, as discussed above,³⁰⁴⁷ in order to extract, remove, duplicate, or copy CAT Data into their own local server environment, the Participants will be required to have policies and procedures regarding CAT Data security that are equivalent to those implemented and maintained by the Plan Processor for the Central Repository,³⁰⁴⁸ and that each Participant must certify and provide evidence to the CISO of the Plan Processor that its policies and procedures for the security of CAT Data meet the same security standards applicable to the CAT

³⁰⁴⁴ SIFMA Letter at 33.

³⁰⁴⁵ See Section V.F.1, supra, for further discussion of the costs of bulk downloads by the Participants.

³⁰⁴⁶ See Section IV.D.6.f, supra.

³⁰⁴⁷ Id.

³⁰⁴⁸ See Section IV.D.6.o, supra.

Data that is reported to and collected and stored by the Central Repository. This requirement should mitigate any increased security risk associated with bulk extractions.

In response to the suggestion that the CAT NMS Plan incorporate real-time analytics,³⁰⁴⁹ the Commission notes that this would require real-time reporting. As discussed further above,³⁰⁵⁰ the Commission considered whether CAT Reporters should be required to report data in real-time when it adopted Rule 613 under Regulation NMS.³⁰⁵¹ While the Commission acknowledged that there might be advantages to receiving data intraday, it stated that the greater majority of benefits that may be realized from development of the CAT do not require real-time reporting.³⁰⁵² Further, the Commission recognized that not requiring real-time reporting upon implementation could result in cost savings for industry participants.³⁰⁵³ The Commission therefore believes that any alternative approach that required real-time reporting would increase the costs of the Plan significantly. However, the commenter did not provide sufficient information to allow the Commission to further analyze the benefits and costs of this alternative.

The Commission agrees with the commenter that suggested that using pre-defined extract templates and uniform global formats such as ISO 20022 could have some benefits in terms of facilitating the exchange of data between national and global regulators. As the Participants

³⁰⁴⁹ Data Boiler Letter at 1, 10.

³⁰⁵⁰ See Section IV.D.3, supra.

³⁰⁵¹ See Adopting Release, supra note 14, at 45765. Indeed, Rule 613 stated that the CAT NMS Plan may not impose a reporting deadline earlier than 8:00 a.m. ET. 17 CFR 242.613(c)(3).

³⁰⁵² See Adopting Release, supra note 14, at 45768.

³⁰⁵³ Id. at 45769.

note, the Plan requires data extracts to use common industry formats,³⁰⁵⁴ but it does not require a particular format.³⁰⁵⁵ However, as explained above and in Section IV.D.2, when selecting a Plan Processor, the Participants will consider whether a Bidder has proposed a format that is easily understood and adoptable by the industry, and the Commission believes that the message format decision must be made in connection with developing the overall architecture for CAT.

7. Clock Synchronization Hours

In the Notice, the Commission solicited comment on alternative requirements for the times during which clock synchronization is required that would provide more flexibility than the requirements of the Plan.³⁰⁵⁶ The Commission discussed its preliminary belief that an alternative that does not require synchronizing clocks when servers are not recording Reportable Events or when precise timestamps are not as important to sequencing, such as outside of normal trading hours, would not materially reduce benefits. Given the responses to the FIF Clock Offset Survey, the Commission also stated that it preliminarily believed that this alternative could reduce costs, because synchronization activities and log entries related to those events would not be as beneficial outside of normal trading hours. The Commission noted, however, that it did not have information necessary to quantify the cost reduction from this alternative because cost information available to the Commission is not broken down by time of day or server status.

One commenter supported alternative clock synchronization hours, stating off-hours clock synchronization “isn’t needed from either a business or regulator perspective” and that

³⁰⁵⁴ Response Letter I at 43.

³⁰⁵⁵ For further discussion of the alternatives related to the data ingestion format, See Section V.H.12, infra.

³⁰⁵⁶ See Notice, supra note 5, at 30764.

“without this provision, firms would require additional off-hours staffing, or it will prevent the off-hours support staff from focusing on more pressing issues that need to be resolved during off hours.”³⁰⁵⁷ However, the commenter did not provide any additional information that would allow the Commission to quantify the potential cost savings. The Commission continues to believe that an alternative that does not require synchronizing clocks when servers are not recording Reportable Events or when precise timestamps are not as important to sequencing, such as outside of normal trading hours, would not materially reduce benefits. The Commission also believes that this alternative could reduce costs, but continues to lack the information necessary to quantify the potential cost reduction.

8. Primary Market Transactions

As set out in the Notice,³⁰⁵⁸ the CAT NMS Plan does not require the reporting of any primary market information to the Central Repository. However, as required by Rule 613(i), the CAT NMS Plan commits to incorporating a discussion of how and when to implement the inclusion of some primary market information into a document outlining how additional Eligible Securities could be reported to the Central Repository (the “Discussion Document”), which would be jointly provided to the Commission within six months after effectiveness of the Plan.³⁰⁵⁹ Additionally, as required by Rule 613(a)(1)(vi), the Plan includes a discussion of the feasibility, benefits, and costs of including primary market transactions in the CAT NMS

³⁰⁵⁷ FIF Letter at 122–23.

³⁰⁵⁸ See Notice, supra note 5, at 30772.

³⁰⁵⁹ See CAT NMS Plan, supra note 5, at Appendix C, Section C.9. Section 6.11 of the Plan satisfies a requirement in 17 CFR 242.613(i) to plan for expansion.

Plan.³⁰⁶⁰ As explained in the Notice,³⁰⁶¹ the discussion in the CAT NMS Plan divides the primary market information into two categories: information on top-account allocations and information on subaccount allocations. Top-account allocations refer to allocations to institutional clients and retail broker-dealers during the book-building process. Top-account institutions and broker-dealers make the subsequent subaccount allocations to the actual accounts receiving the shares. The Plan concludes that including information on subaccount allocations in the CAT would provide significant benefits without unreasonable costs, while including information on top-account allocations would provide marginal benefits at significantly higher costs.³⁰⁶²

As discussed in the Notice, the Plan states that “the Participants are supportive of considering the reporting of Primary Market Transactions, but only at the subaccount level, and would incorporate analysis of this requirement, including how and when to implement such a requirement, into their document outlining how additional Eligible Securities could be reported to the Central Repository, in accordance with SEC Rule 613(i) and Section 6.11 of the Plan.”³⁰⁶³ The Plan therefore would limit the discussion of reporting primary market transactions in the Discussion Document to the subaccount level.

In the Notice, the Commission solicited comment on the alternative approach that would broaden the required scope of the discussion of primary market allocation information in the Discussion Document to include an analysis of incorporating both top-account and subaccount

³⁰⁶⁰ 17 CFR 242.613(a)(1)(vi); CAT NMS Plan, supra note 5, at Appendix C, Section A.6.

³⁰⁶¹ See Notice, supra note 5, at 30772.

³⁰⁶² See CAT NMS Plan, supra note 5, at Appendix C, Section A.6(b)–(c).

³⁰⁶³ Id. at Appendix C, Section A.6(c).

allocation information for primary market transactions into the CAT.³⁰⁶⁴ To assess this alternative, the Commission examined the benefits and costs of ultimately including top-account allocations in the CAT. The Commission preliminarily believed that the potential benefits of including top-account allocation information in the CAT could be significant and that the costs of including top-account allocation information could be lower than what is described in the CAT NMS Plan and appropriate in light of significant potential benefits. For these reasons, the Commission preliminarily believed that top-account allocation information should not be excluded from the Discussion Document.³⁰⁶⁵

In the Notice, the Commission discussed several benefits of including top-account allocation information, in addition to subaccount allocation information, for primary market transactions in CAT. First, the Commission noted that top-account allocation information would be necessary to surveil for prohibited activities in the book-building process and would improve the efficiency of investigations into such prohibited activities. For example, examinations of “spinning,” “laddering,” and other “quid pro quo” arrangements would benefit from inclusion of top-account allocation information in CAT Data. Second, the Commission noted that top-account allocation information would provide very useful insights into IPO and follow-on allocations in market analysis and that such insights would help inform rulemaking and other policy decisions.³⁰⁶⁶

³⁰⁶⁴ See Notice, supra note 5, at 30772.

³⁰⁶⁵ Id.

³⁰⁶⁶ Id. at 30773.

As discussed in the Notice,³⁰⁶⁷ the CAT NMS Plan estimates that for broker-dealers to implement a system to record and report both top-account and subaccount allocation information for primary market transactions would cost \$234.8 million, whereas implementing a system with only subaccount information would cost \$58.7 million.³⁰⁶⁸ The inclusion of top-account allocation information accounts for the difference of \$176.1 million.

In the Notice, the Commission discussed its preliminary belief that the implementation costs of adding top-account allocation information may be lower than those estimated in the CAT NMS Plan, for several reasons. First, the Commission noted that, in combination with an alternative that would require less granular timestamps or a larger allowable clock offset on less time-sensitive systems, including the systems for reporting top-account allocation information, the costs for including top-account allocation information would be lower than indicated in the Plan. Second, the Commission noted that the Plan's estimate was sensitive to the number of underwriters. In particular, the estimates assumed that all underwriters participating in an offering would need to implement changes for top-account allocation information. In contrast, the Commission suspected that lead underwriters could have all of the information necessary to report the top-account allocation information. If so, then only the lead underwriters would need to implement systems changes to report top-account allocation information. Estimating costs only for lead underwriters could result in a much smaller estimate.³⁰⁶⁹

The Commission noted that it did not have an estimate of the ongoing costs of underwriters reporting top-account allocation information. However, the Commission

3067

Id.

3068

See CAT NMS Plan, supra note 5, at Appendix C, Section A.6(c).

3069

See Notice, supra note 5, at 30773.

preliminarily estimated that the reporting of primary market transactions would generate a total of 1.2 million CAT Reportable Events per year. The Commission noted that this total was much smaller than the number of Reportable Events in the secondary market (trillions). The Commission preliminarily believed that the ongoing costs of reporting primary market transactions would be a fraction of the ongoing costs of secondary market reporting and would likely be supported by staff already engaged to maintain CAT reporting.³⁰⁷⁰

The Commission received three comment letters that provided information relevant to the Commission's economic analysis of this alternative, though the comments focused more on the inclusion of primary market transactions in the initial phase of the Plan as opposed to in the Discussion Document. In particular, commenters provided information relevant to the baseline, benefits, and costs of the inclusion of top-account primary market information in the Plan.³⁰⁷¹

Commenters provided information relevant to the current baseline of the underwriting process and primary market transaction records. One commenter documented significant diversity across underwriters in the volume of deals and workflows and provided more precise information on that diversity than included in the Notice or Plan.³⁰⁷² The commenter further stated that the processes that handle top-account allocations are very separate from the secondary market systems. Another commenter described three stages in the offering process: 1) preliminary indications of interest, 2) final top-account allocation, and 3) subsequent subaccount

³⁰⁷⁰ Id. at 30773–74.

³⁰⁷¹ Commenters also provided general information on primary market transactions that could inform the Discussion Document. See FIF Letter at 118–20; SIFMA Letter at 36; Hanley Letter at 1–6.

³⁰⁷² FIF Letter at 118–19.

allocations.³⁰⁷³ Both commenters agreed that indications of interest in top-account allocations can change numerous times,³⁰⁷⁴ but one commenter indicates the existence of a final top-account allocation (Stage 2) while the other does not.

Two commenters provided different perspectives on the benefits of including top-account allocation information in the Discussion Document. One commenter emphasized that many benefits could only be achieved by requiring the reporting of primary market transactions at both the top-account and the subaccount allocation levels.³⁰⁷⁵ In particular, the commenter maintained that because lead underwriters were responsible for the top-account allocations, some abuses, such as “spinning,” “laddering,” “quid pro quo,” Rule 105 violations, and manipulation, could only be present in these allocations.³⁰⁷⁶ Further, this commenter also stated that top-account information would facilitate analyses of the value of discretionary allocation in book-building for issuers. This commenter also indicated that final top-account allocations should be sufficient to achieve such benefits, while also indicating that information on the indications of interest was crucial for the understanding of the capital formation process and for designing efficient regulations that would facilitate capital formation without compromising investor protection.³⁰⁷⁷ The other commenter believed that having only subaccount primary market

³⁰⁷³ Hanley Letter at 4.

³⁰⁷⁴ FIF Letter at 118; Hanley Letter at 4.

³⁰⁷⁵ Hanley Letter at 4.

³⁰⁷⁶ Hanley Letter at 4.

³⁰⁷⁷ Hanley Letter at 5–6.

allocation information is less valuable from a regulatory perspective than having both subaccount and top-account allocation information.³⁰⁷⁸

The Commission received three comment letters relevant to the costs of including top-account allocation information in the Plan. All three commenters indicated that it would be very costly to include top-account allocations in the Plan,³⁰⁷⁹ but one commenter limited this conclusion just to the inclusion of indications of interest.³⁰⁸⁰ According to the commenters, these costs generally stem from added complexity and a lack of standardization in book-building processes. Another commenter noted that top-account allocations would be less feasible to report than subaccount allocations and cited to information from the DAG.³⁰⁸¹ One commenter disagreed with the Plan's cost estimates of \$176 million for including top-account allocation information in the Plan and provided an alternative estimate of \$864,000 per year.³⁰⁸² Another commenter indicated that the Plan's estimates amounted to guesswork and that the \$176 million estimate in the Plan does not contemplate reporting all the events in a deal's lifecycle, but does not indicate which events it does include.³⁰⁸³

Two commenters recommended additional analysis on some or all top-account allocation information, but neither specifically mentioned the Discussion Document. One commenter noted having little information about the requirements of reporting top-account allocation information and that subaccount allocation information is a good first step toward potentially

³⁰⁷⁸ FIF Letter at 120.

³⁰⁷⁹ FIF Letter at 120; Hanley Letter at 4; SIFMA Letter at 36.

³⁰⁸⁰ Hanley Letter at 4.

³⁰⁸¹ SIFMA Letter at 36.

³⁰⁸² Hanley Letter at 4–5.

³⁰⁸³ FIF Letter at 120.

collecting complete information on primary market activities that would allow time to study the complexities and difficulties associated with reporting top-account allocations.³⁰⁸⁴ This commenter also attempted a further study of more generally including primary market information in the Plan but noted that the 60-day comment period did not permit a larger, more in depth study.³⁰⁸⁵ Another commenter suggested considering an alternate reporting scheme for indications of interest other than CAT that better balances the costs of producing data indications of interest but does not diminish the usefulness of such data.³⁰⁸⁶

In their response, the Participants reiterated their support for the inclusion in the CAT of subaccount allocations in Primary Market Transactions, but not top-account allocations, and reiterated the conclusions from the Plan that reporting top-account allocations would likely impose significant costs to CAT Reporters while only providing a marginal additional regulatory benefit over subaccount allocation data.³⁰⁸⁷ In response to comments regarding the scope of top-account allocation information, the Participants restated the definition in the Plan that top-account allocations are allocations to institutional clients or retail broker-dealers, which are conditional and may fluctuate until the offer syndicate terminates.³⁰⁸⁸ The Participants did not respond to the comment that the cost estimates in the Plan do not contemplate reporting all events in a deal's lifecycle and did not further discuss why top-account allocation information should not be included in the Discussion Document.

³⁰⁸⁴ FIF Letter at 13, 120.

³⁰⁸⁵ FIF Letter at 119.

³⁰⁸⁶ Hanley Letter at 5–6.

³⁰⁸⁷ Response Letter I at 49.

³⁰⁸⁸ Response Letter I at 50.

The Commission is revising its analysis of the economic effects of including top-account primary market transactions in the CAT and thus of whether top-account allocations should be included in the Discussion Document in light of comments and the Participants' response. With respect to the benefits of including top-account allocation information, in addition to subaccount allocation information, in the CAT, none of the commenters disagreed with the Commission's analysis. In fact, the Commission is expanding its analysis to include the additional benefits noted by one commenter that the Commission had not previously considered, namely better understanding the economics of the offering process and better identifying manipulative activities.³⁰⁸⁹ Further, the Participants' response provided no new information on why Participants believe top-account allocations provide only a marginal regulatory benefit over sub-account allocation data. Therefore, the Commission continues to believe that top-account primary market allocation information would provide significant regulatory benefits.

With respect to the costs of including top-account allocation information in the CAT, the Commission notes that the estimate of \$864,000 per year provided by one of the commenters may not be comparable to the estimate of \$176.1 million provided in the CAT NMS Plan. This is because the latter estimate reflects the implementation costs of adding top-account allocation information, while the former estimate seems to measure the ongoing annual costs to maintain the reporting.

At the same time, the Commission believes that the commenter's analysis of costs is consistent with the Commission's analysis in the Notice in two respects. First, the commenter's analysis is consistent with the Commission's preliminary conclusion that requiring less granular

³⁰⁸⁹ Hanley Letter at 1–4.

timestamps for reporting top-account allocation information would result in lower costs for top-account allocation information than indicated in the Plan. Second, the commenter's estimate that reporting top-account allocation information would cost \$864,000 per year in ongoing costs is consistent with the Commission's preliminary conclusion that the ongoing costs of reporting primary market transactions would be a fraction of the ongoing costs of secondary market reporting. Indeed, \$864,000 per year represents a small fraction of the total ongoing annual cost of CAT, which the Commission estimates to be \$1.7 billion per year.³⁰⁹⁰

With respect to the commenter who indicated that the cost estimates in the Plan did not contemplate indications of interest, the Commission notes that the Plan defines top-account allocations to include indications of interest—"conditional and may fluctuate until the offering syndicate terminates"³⁰⁹¹—and suggests that its cost estimates for top-account allocations therefore include indications of interest. However, because this commenter conducted the study that provides the basis for the Plan's cost estimate, the Commission believes that the commenter is correct and that the cost estimates in the Plan do not represent the costs of top-account allocations as defined in the Plan (*i.e.*, the estimates do not cover indications of interest). That said, no comments directly disagreed with the reasons that the Commission provided in the Notice for why the Commission preliminarily believed the costs estimates in the Plan overstated the costs of including top-account allocation information in the Plan.³⁰⁹² Therefore, in light of the comments, the Commission is less clear on the magnitude of the costs of including top-account allocation information in the Plan.

³⁰⁹⁰ See Section VI.F.2, supra.

³⁰⁹¹ See CAT NMS Plan, supra note 5, at Appendix C, Section A.6(a).

³⁰⁹² See Notice, supra note 5, at 30773.

In response to the commenters that indicated that additional analysis or consideration of including top-account allocation information in the Plan would be beneficial, the Commission notes that including this alternative in the Discussion Document provides an opportunity for this additional analysis and consideration. The Discussion Document will provide an outline of how the Participants could incorporate top-account allocation information into the CAT Data and include details for each order and Reportable Event that may be required to be provided, which market participants may be required to provide the data, the implementation timeline, and a cost estimate. Indeed, in addition to the commenters' suggestions for more study, the Commission believes that the information from commenters regarding the benefits of the different types of top-account allocation information, and the questions surrounding the cost estimates in the Plan, suggest that investors could benefit from the additional analysis that would be included in the Discussion Document.

9. Periodic Updates to Customer Information

In the Notice, the Commission solicited comment on an alternative that would eliminate the requirement for periodic full refreshes of customer information.³⁰⁹³ The Commission stated that the requirement for periodic full refreshes could be redundant if the initial list and daily updates are complete and accurate and would, therefore, provide no additional benefit. Further, not requiring these periodic refreshes could reduce the risk of a security breach of personally identifiable information. Therefore, the Commission preliminarily believed that removing the requirements for periodic full refreshes of customer information could minimally reduce the cost of the Plan without materially reducing the benefits.

³⁰⁹³ See Notice, supra note 5, at 30775–76.

The Commission received two comments relevant to this alternative. One commenter suggested “having the functional support for a voluntary full refresh, but...eliminat[ing] the mandated requirement to provide full refreshes periodically,” and stated that, “the initial load, daily updates and standard error processing should be sufficient to maintain data integrity.”³⁰⁹⁴ That commenter went on to state that it “may be easier to define all active customers to CAT, or just active customers who have transacted in NMS securities.” The commenter stated that removing the requirement may “only slightly reduce the burden or cost,” although it would improve the overall security of the CAT.³⁰⁹⁵ Another commenter stated their belief that, “periodic refreshes of all customer information to the Central Repository is a bad idea.”³⁰⁹⁶ In their response, the Participants stated that they believe that a periodic refresh of customer information is beneficial because it will help to ensure that all customer information remains accurate and up to date.³⁰⁹⁷ The Participants noted the provisions in the Plan with respect to information security.³⁰⁹⁸ The Participants also noted that the Plan provides that the Participants will define the scope of what constitutes a “full” customer information refresh with the assistance of the Plan Processor to determine the extent to which inactive or other accounts would need to be reported.³⁰⁹⁹

The Commission has considered the comments and the Participants’ response and continues to believe that removing the requirements for periodic full refreshes of customer

³⁰⁹⁴ FIF Letter at 22.

³⁰⁹⁵ FIF Letter at 93.

³⁰⁹⁶ Data Boiler Letter at 41.

³⁰⁹⁷ Response Letter I at 31–32.

³⁰⁹⁸ Response Letter I at 31–32.

³⁰⁹⁹ Response Letter I at 31–32.

information could minimally reduce the cost of the Plan without materially reducing the benefits. Specifically, the Commission agrees that allowing market participants to periodically refresh their customer information but dropping the requirement that they refresh it regularly would reduce costs to broker-dealers because broker-dealers could choose to do a refresh when they believe a full refresh would be more cost effective than editing individual records, while not requiring them to do a refresh when they believe their customer information stored in the Central Repository is accurate. Having a full refresh as an option would save broker-dealers the costs associated with running a refresh procedure when it is not needed, but allowing it when it is efficient for the broker-dealer to update its customer information in this manner. The Commission disagrees with the comment that periodic refreshes are a “bad idea” in general. As discussed above,³¹⁰⁰ the Commission recognizes that periodic refreshes introduce an opportunity for correct data in the Central Repository to be replaced by incorrect data due to a problem in the refresh procedure. However, the Commission also believes that periodic refreshes provide an opportunity for incorrect information in the Central Repository to be replaced with correct information. The Commission does not have information to estimate whether the former outcome is more likely than the latter, because it lacks information on the proportion of customer information records that are errant in existing databases in industry and the likelihood that data refresh procedures introduce incorrect data, and commenters did not provide this information. The Commission notes that the Participants’ response does not address whether the periodic refreshes would be redundant, or why submitting the redundant information would be beneficial. However, the Commission acknowledges that, as set out in the Participants’ response, the Plan

³¹⁰⁰ See Section V.E.3.a, *supra*.

provides that the Participants will work with the Plan Processor to determine the extent to which inactive or other accounts would need to be reported,³¹⁰¹ which may reduce the costs of the periodic refresh by reducing the number of accounts to which it applies.

10. Bulk Data Downloads by CAT Reporters

Several commenters discussed the Plan's treatment of bulk data downloads by CAT Reporters. Specifically, some commenters suggested that CAT Reporters should be allowed to access and export the data they report to the Central Repository. The Commission has considered the potential economic effects of that alternative approach, as discussed below.

Several commenters suggested that the Plan permit CAT Reporters to access their own CAT Data through bulk data exports.³¹⁰² Another commenter stated that permitting CAT Reporters to download their own data from the Central Repository will provide benefits such as improved CAT reporting error rates and improved ability to meet regulatory, surveillance, and compliance requirements.³¹⁰³ One commenter suggested that independent software vendors be permitted to access the CAT Data on behalf of their clients.³¹⁰⁴ However, several commenters expressed strong concerns about allowing any entity to extract or download data from the Central Repository, suggesting that the risk of a data breach would greatly increase as the data are maintained at more sites.³¹⁰⁵ Commenters also suggested that the risk increases when those

³¹⁰¹ Response Letter I, at 31–32.

³¹⁰² FIF Letter at 1, 9, 60–61; KCG Letter at 7–8.

³¹⁰³ TR Letter at 8.

³¹⁰⁴ Bloomberg Letter at 7.

³¹⁰⁵ SIFMA Letter at 20; Fidelity Letter at 4; ICI Letter at 6–7.

entities downloading the data may have technology systems that are not subject to the same high security requirements at the Plan Processor.³¹⁰⁶

In their response, the Participants stated that they believe that there may be merit to providing Industry Member CAT Reporters and their vendors with bulk access to the CAT Reporters' own unlinked CAT Data, but noted that such access also raises a variety of operational, security, cost and other issues related to the CAT. The Participants stated that they will consider this issue once the CAT is operational.³¹⁰⁷

Currently, the CAT NMS Plan states that, initially, CAT Reporters will not have access to their data submissions through bulk data extracts.³¹⁰⁸ The Commission agrees with commenters that an alternative approach that specified that CAT Reporters will be allowed to make bulk extractions of their own data from the Central Repository would help CAT Reporters correct errors and respond to regulatory inquiries. Specifically, the Commission believes that, by querying and analyzing the full set of data submitted to the CAT, as opposed to viewing only the errors, CAT Reporters may be able to better diagnose a problem that could be system-wide. This could facilitate corrections to the process that CAT reporters use to record and report order events to prevent future errors. The Commission also recognizes that there may be benefits to internal surveillance regarding compliance, tracking regulatory submissions by third parties, and CAT Reporter recordkeeping.³¹⁰⁹ The Commission believes this could have benefits in terms of increasing the accuracy and timeliness of the CAT Data by allowing errors to be corrected faster

³¹⁰⁶ FSR Letter at 7.

³¹⁰⁷ Response Letter I at 43–44.

³¹⁰⁸ See CAT NMS Plan, supra note 5, at Appendix D, Section 8.2.

³¹⁰⁹ FIF Letter at 60–61.

and more effectively, and by possibly reducing reporting costs for some entities by making the error correction process easier and more efficient and eliminating the need for CAT Reporters to store the data they submit on their own systems.

However, the Commission notes that, under the Plan, CAT Reporters will be able to view their submissions online in a read-only, non-exportable format, which will facilitate error identification and correction.³¹¹⁰ Commenters did not provide sufficient information to allow the Commission to assess the magnitude of the potential benefits of allowing bulk data exports in addition to read-only access,³¹¹¹ and the Commission believes they may be modest. The Commission also notes that, to the extent CAT Reporters retain copies of their submissions, they may be able to refer to that data when correcting errors and responding to regulatory inquiries. Further, the Commission also agrees with commenters and the Participants that allowing CAT Reporters to engage in bulk data exports, even if limited to their own reported data, could increase the risk of a data breach insofar as it increases the number of systems that have access to the CAT Central Repository. As discussed above,³¹¹² while uncertain, the costs of a security breach could be significant. The Commission recognizes that some CAT Reporters that would be downloading bulk data might already have access to the Central Repository in order to upload their data, but it notes that many may not, because their data may be reported by one or more third parties. The Commission notes that it is difficult to determine the magnitude by which the risk of a breach would increase, because many of the decisions that define security measures for

³¹¹⁰ See CAT NMS Plan, supra note 5, at Appendix D, Section 10.1.

³¹¹¹ For example, the Commission does not know how many of the errors that may need to be corrected may be rooted in a problem that a CAT Reporter would require bulk-downloaded data to detect.

³¹¹² See Section V.F.4.a, supra.

the Central Repository are coincident with the selection of the Plan Processor, and there is considerable diversity in the potential security approaches of the Bidders. The Commission notes that the Participants state that they will reconsider the issue once the CAT is operational.³¹¹³

11. Alternatives to the CAT NMS Plan

In the Notice, the Commission recognized that approving the CAT NMS Plan is not the only available means of improving the completeness, accuracy, accessibility and timeliness of the data used in regulatory activities.³¹¹⁴ Therefore, the Commission solicited comment on the broad set of alternatives involving modifying existing systems to reduce their data limitations instead of approving the CAT NMS Plan.

The Commission discussed how, as one alternative to the CAT NMS Plan, it could require modifications to OATS. However, the Commission also noted that OATS would require significant modifications in order to provide the attributes that the Commission deems crucial for an effective audit trail. Furthermore, the Commission indicated that any OATS-based alternative to CAT that did not provide these attributes would limit the potential benefits of the alternative significantly.³¹¹⁵

The Commission acknowledged that it does not have sufficient information to estimate the potential cost savings, if any, from mandating an OATS-based approach as an alternative to the CAT NMS Plan. However, the Commission noted that Rule 613 provided flexibility to the SROs to propose an approach based on OATS and that the SROs could have utilized an OATS-

³¹¹³ Response Letter I at 44.

³¹¹⁴ See Notice, supra note 5, at 30776.

³¹¹⁵ Id.

based approach if that approach had represented significant cost savings relative to the Plan’s approach.³¹¹⁶

In the Notice, the Commission discussed another alternative, which would be for the Commission to modify other data sources instead of, or in combination with, OATS. However, the Commission also noted that like OATS, all of the current data sources have limitations that would need to be addressed in order to provide the attributes that the Commission deems crucial to an effective audit trail. Furthermore, the Commission preliminarily believed that modifying any other single data source would be more costly than modifying OATS while adopting an alternative to the CAT NMS Plan that relied on multiple data sources ... would eliminate the benefits associated with having a single complete consolidated source from which regulators can access trade and order data, which the Commission considers to be very significant.³¹¹⁷

Overall, the Commission preliminarily believed that mandating improvements to the completeness, accuracy, accessibility, and timeliness of current data sources without an NMS Plan that requires the consolidation of data and increased coverage across markets and broker-dealers would likely significantly limit the potential benefits relative to the Plan, possibly without providing significant cost savings.³¹¹⁸

The Commission received one comment on the possibility of requiring modifications to OATS as an alternative to the CAT NMS Plan. The commenter agreed with the Commission’s analysis and the CAT NMS Plan approach, noting that “the vision of CAT has evolved through the years to become a much more comprehensive system than OATS or any other current

3116 Id.

3117 Id.

3118 Id.

system” and that “there is an opportunity now to take advantage of new technologies and the associated cost benefits they provide.”³¹¹⁹ Another commenter suggested an alternate approach to the CAT NMS Plan where the Commission would host the system in-house, under its direct and sole control, retaining the prerogative to grant (or deny) access to the data to non-broker-dealer affiliated SROs.³¹²⁰ The commenter believed that collecting the data pursuant to an NMS Plan providing for SRO ownership, management and control over the data would limit the benefits of the Plan by potentially limiting the Commission’s access to, and use of, CAT Data.³¹²¹

The Commission has considered the comments and continues to believe that mandating improvements to the completeness, accuracy, accessibility, and timeliness of current data sources without an NMS Plan that requires the consolidation of data and increased coverage across markets and broker-dealers would likely significantly limit the potential benefits, possibly without providing significant cost savings. In response to the suggestion that the Commission host the system in-house, the Commission believes that the concerns expressed by the commenter with respect to the Commission’s ability to access and utilize the CAT Data are mitigated by the Commission’s direct oversight authority with respect to the CAT NMS Plan,

³¹¹⁹ FIF Letter at 121.

³¹²⁰ Better Markets Letter at 3–5.

³¹²¹ Specifically, the commenter stated that allowing the SROs ownership, management, and control over the data, without direct SEC oversight and control, would have “serious and unacceptable” consequences, because there will be a limited number of user accounts allocated to the SEC; there may be limitations on the SEC’s access to the data for non-regulatory purposes; the potential exists for the CAT LLC to charge the SEC for accessing the CAT system and its data; the SEC does not participate directly in the governance of the CAT Plan; the CAT Plan Participants may dismiss the Plan Processor with no notice to the SEC; and the Plan Participants may make material changes to the functions and operations of the CAT NMS system (or matters related to the CAT data).

including but not limited to its ability to observe all meetings, including those conducted in Executive Session, its review and approval of rule changes, and its examination and inspection authority over the SROs. Further, as discussed above,³¹²² SROs have specific obligations under the Exchange Act as front-line regulators of the securities markets, and accordingly are well-positioned to oversee the development and operation of the CAT in a manner that will best fulfill regulatory needs, subject to oversight by the Commission. The Commission therefore does not agree that an alternative to the CAT NMS Plan where the Commission hosted the system in-house would result in greater benefits as compared to the CAT NMS Plan approach.

12. Alternatives Discussed in the CAT NMS Plan

In the Notice, the Commission recognized that the Plan discussed many alternatives that the Commission did not discuss in the Alternatives Section of the Notice.³¹²³ Rule 613(a)(1)(xii) required the Participants to discuss in the Plan any reasonable alternative approaches that the Plan sponsors considered in developing the Plan, including a description of any such alternative approach; the relative advantages and disadvantages of each such alternative, including an assessment of the alternative's costs and benefits; and the basis upon which the Plan sponsors selected the approach reflected in the CAT NMS Plan. Such discussions appear in Section 12 of Appendix C of the Plan. The Commission reviewed these alternatives and did not include in the Alternatives Section of its Notice a discussion of all of the specific alternatives addressed in the Plan. In some cases, the Commission had no analysis to add beyond the analysis in the Plan. In other cases, the Plan did not require any specific

³¹²² See supra note 747.

³¹²³ See Notice, supra note 5, at 30779–82 (Request for Comment Nos. 437–50).

alternative, so the Commission could not analyze the effect on the Plan of selecting a different alternative.

The Commission received sufficient comments to analyze some economic implications of alternatives related to the primary storage method, data ingestion format approaches, the process to develop the CAT, and user support and the help desk. However, the Commission still does not have sufficient information to add to the Plan’s analysis of the alternatives regarding organizational structure,³¹²⁴ personally identifiable information,³¹²⁵ required reportable events,³¹²⁶ data feed connectivity,³¹²⁷ industry testing,³¹²⁸ user management,³¹²⁹ and quality assurance³¹³⁰.

³¹²⁴ The Commission received one comment on its request for comment regarding the organizational structure. Better Markets opposes the for-profit nature of the CAT LLC and the fact that the Commission would not control that corporation. See Section IV.B.4, supra, discusses the Participants’ and the Commission’s responses to that comment. Specifically, the CAT LLC will not be for-profit.

³¹²⁵ Many commenters suggested alternative approaches to maintain the security and confidentiality of PII. See Section IV.D.7.b, supra, for a summary of these comments and the Commission’s response.

³¹²⁶ Data Boiler suggested including the “results order event” and the “CAT feedback order event” as a “way to introduce randomness for the sake of improving information security control.” While the Commission is sensitive to security, the Commission still does not have sufficient information to distinguish these order events from the required order event types to ascertain the benefits other than the security benefits mentioned by this commenter or to analyze the costs of reporting these order types. See Data Boiler Letter at 42.

³¹²⁷ Data Boiler suggested receiving SIP data in real-time, but did so conditional on the Central Repository receiving the data in real-time. Because the SROs may already get SIP data in real-time for other purposes and the CAT reporting will be on T+1, the Commission still does not have sufficient information to fully analyze the alternative of receiving SIP data in real-time. See Data Boiler Letter at 42; see also Section IV.D.3, supra, for the Commission’s response to this comment.

³¹²⁸ Data Boiler suggested not mandating an approach to industry testing because “appropriate management flexibilities/discretions are needed,” but did not provide further explanation that would allow the Commission to better understand the economic

a. Primary Storage

In the Notice, the Commission solicited comment on whether the CAT NMS Plan should mandate a particular data storage method and on how a storage method could affect the costs and benefits of the Plan.³¹³¹ The CAT NMS Plan states that bidders proposed two methods of primary data storage: traditionally-hosted storage architecture and infrastructure-as-a-service.³¹³² The CAT NMS Plan does not mandate a specific method for primary storage, but does indicate that the storage solution would meet the security, reliability, and accessibility requirements for the CAT, including storage of PII data, separately. The CAT NMS Plan also indicates several

tradeoffs. See Data Boiler Letter at 42. Further, FIF suggested specific testing standards but did not provide further explanation that would allow the Commission to better understand the economic tradeoffs of specifying these standards. See FIF Letter at 13, 125–26; see also Section IV.D.12, supra, for the Commission’s response to these comments.

³¹²⁹ FIF stated that the Plan does not need to require a specific approach to user management, but that the Plan should specify some functionality and criteria for evaluation of the approach. For example, the user management system should provide for on-boarding and support levels of entitlement. See FIF Letter at 129–30. The commenter did not provide further explanation that would allow the Commission to better understand the costs and benefits of specifying these functionalities or not specifying an approach. Further, SIFMA provided specific suggestions for user management but did not specifically address the relative economic effects of various alternatives. See SIFMA Letter at 21.

³¹³⁰ Data Boiler suggested not mandating an approach to quality assurance because appropriate management flexibilities /discretions are needed, but did not provide further explanation that would allow the Commission to better understand the economic tradeoffs. See Data Boiler Letter at 42.

³¹³¹ See Notice, supra note 5, at 30780.

³¹³² See CAT NMS Plan, supra note 5, at Appendix C, Section D.12(c). Traditionally-hosted storage architecture is a model in which an organization would purchase and maintain proprietary servers and other hardware to store CAT Data. Infrastructure-as-a-service is a provisioning model in which an organization outsources the equipment used to support operations, including storage, hardware, servers, and networking components, to a third party who charges for the service on a usage basis.

considerations in the selection of a storage solution including maturity, cost, complexity, and reliability of the storage method.

The Commission received three comment letters in response to this alternative.³¹³³ All three commenters recommended not mandating a particular storage method. One commenter suggested that mandating the storage method would “make the structure too rigid and static, hindering the flexibility for future scalability.”³¹³⁴ Another commenter claimed too little information in that the “eventual Plan Processor is in a better position to define the storage methods” stating that evaluation considers “total system design, not storage methods in isolation.”³¹³⁵ The third commenter did not provide arguments supporting its recommendation, but did point out that the method of storage would allow the ability to return results of queries at varying time intervals.³¹³⁶ The commenters did not discuss the relative costs and benefits of the specific architectures mentioned in the Plan but one commenter indicated that its own system could enable ultrafast analysis/ pattern recognition and save significant space.³¹³⁷ Based on these comments, the Commission believes that mandating a particular storage method could be costly, but Commission did not receive comments on the benefits of mandating a storage method or on the costs or benefits of particular storage methods. Therefore, the Commission has more information than at the time of the Notice regarding the costs of mandating a particular storage method but still cannot fully analyze the economic effects.

³¹³³ FIF Letter at 125; FSI Letter at 3; Data Boiler Letter at 8.

³¹³⁴ Data Boiler Letter at 8.

³¹³⁵ FIF Letter at 125.

³¹³⁶ FSI Letter at 3.

³¹³⁷ Data Boiler Letter at 8.

b. Data Ingestion Format

In the Notice, the Commission requested comment on whether the Plan should mandate a particular approach to data ingestion.³¹³⁸ The CAT NMS Plan does not mandate the format in which data must be reported to the Central Repository.³¹³⁹ Rather, the Plan provides that the Plan Processor will determine the electronic format in which data must be reported, and that the format will be described in the Technical Specifications.³¹⁴⁰ The Plan discusses the tradeoffs between requiring that the CAT Reporters report data to CAT in a uniform defined format, in existing messaging protocols, or a hybrid of both.³¹⁴¹ The Plan does not require any approach, but will determine the approach in conjunction with the selection of the Plan Processor. An example of a uniform defined format includes the current process for reporting data to OATS.³¹⁴² Several bidders proposed to leverage the OATS format and enhance it to meet the requirements of Rule 613. The Plan states that this could reduce the burden on certain CAT Reporters (*i.e.*, current OATS Reporters) and simplify the process for those CAT Reporters to implement the CAT.³¹⁴³ The other alternative, accepting existing messaging protocols, would allow CAT Reporters to submit copies of their order handling messages that are typically used across the

³¹³⁸ See Notice, *supra* note 5, at 30780–81.

³¹³⁹ See CAT NMS Plan, *supra* note 5, at Appendix C, Section D.12(f); see also *id.* at Appendix C, Section A.1(a).

³¹⁴⁰ *Id.* at Appendix D, Section 2.1.

³¹⁴¹ See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(i)(A)(2), Section D.12(f). These are also called “Approach 1” and “Approach 2” elsewhere in this economic analysis.

³¹⁴² This is Approach 2 in the CAT Reporters Study. See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(i)(A)(2).

³¹⁴³ *Id.* at Appendix C, Section D.12(f).

order lifecycle and within order management processes, such as FIX.³¹⁴⁴ The Plan states that using existing messaging protocols could result in quicker implementation times and simplify data aggregation.³¹⁴⁵ The Plan further notes that surveys revealed no cost difference between the two approaches,³¹⁴⁶ but that FIF members prefer using the FIX protocol.³¹⁴⁷

While the Plan discussed a “uniform defined format” as different from existing messaging protocols such as FIX, the Commission understands that the term “uniform defined format” can also apply to FIX. To clarify the distinction between the two approaches, the Commission refers to one approach as requiring a “specialized delimited flat file” approach and the other as requiring existing messaging protocols.

In addition to soliciting comment on whether the Plan should mandate an approach, the Commission also requested information on the relative costs and benefits, including implementation and ongoing costs of the data ingestion format approaches.³¹⁴⁸ Further, the Commission noted that the survey results that the costs of the approaches are similar did not seem intuitive and requested comment on why the costs appear similar in the survey results.³¹⁴⁹

As an alternative to the Plan, four commenters seemed to support specifying an approach to data ingestion format.³¹⁵⁰ One commenter stated that mandating an approach in the Plan

³¹⁴⁴ This is Approach 1 in the CAT Reporters Study. Id. at Appendix C, Section B.7(b)(i)(A)(2).

³¹⁴⁵ Id. at Appendix C, Section D.12(f).

³¹⁴⁶ Id.

³¹⁴⁷ Id.

³¹⁴⁸ See Notice, supra note 5, at 30780–81.

³¹⁴⁹ See Notice, supra note 5, at 30737 (Request for Comment Nos. 318 and 331).

³¹⁵⁰ FIF Letter at 91; FIX Trading Letter at 1; Better Markets Letter at 7; ICI Letter at 13.

would give industry more time to prepare and would limit the chances that broker-dealers would need to make significant changes after seeing the Technical Specifications, which could seriously compromise the implementation schedule.³¹⁵¹ In particular, this commenter stated that the data ingestion format approach is a critical component of the Plan and “an optimum solution that meets the needs of industry at reasonable cost and is minimally disruptive” would require that the approach be “widely reviewed and vetted across the industry.”³¹⁵² Another commenter suggested mandating the approach for consistency and transparency.³¹⁵³ The other two commenters that supported mandating the approach in the Plan provided arguments regarding the effects of a specific approach but not the effects of mandating an approach.

Another alternative would be to specify the actual format in the Plan. Of the four commenters who supported mandating the approach, one also supported mandating the format in the Plan.³¹⁵⁴

Six commenters provided information on the tradeoffs or economic effects of various approaches or formats.³¹⁵⁵ While some commenters addressed the alternatives of a specialized delimited flat file such as a modified OATS, existing messaging protocol such as FIX, or a hybrid of the two,³¹⁵⁶ others commented more generally on the impacts of non-uniform formats or standards without indicating whether they consider a messaging protocol to be non-uniform or

³¹⁵¹ FIF Letter at 90.

³¹⁵² FIF Letter at 90.

³¹⁵³ FIX Trading Letter at 1.

³¹⁵⁴ Better Markets Letter at 7.

³¹⁵⁵ These comments are summarized in more detail in Section IV.D.2, supra.

³¹⁵⁶ FIF Letter at 90–91; FIX Trading Letter at 1. ICI provided a messaging protocol as an example, but did not recommend a messaging protocol specifically.

uniform format or standard.³¹⁵⁷ Only one commenter specifically addressed why the costs of reporting using Plan-mandated messaging protocols would be similar to reporting in a specialized delimited flat file format, and that commenter asserted that the costs should be the same for either approach because accepting existing message protocols would require a more expensive infrastructure and the cost would likely be passed down to the CAT Reporters.³¹⁵⁸ The six commenters also provided mixed information on the economic effects of various considerations,³¹⁵⁹ such as accepting multiple formats or a single format,³¹⁶⁰ and accepting only widely used existing formats, new specialized delimited flat file formats, or existing bespoke broker-dealer formats.³¹⁶¹

In response to comments, the Participants explained that they continue to believe that the Plan should not mandate a specific message format.³¹⁶² That said, the Participants understand that the message format used for reporting to the Central Repository must be easily understood and adopted by the industry, and this factor will be considered as the Participants evaluate each Bidder's solution. Moreover, the Participants also will take into consideration that the Plan Processor must be able to reliably and accurately convert data to a uniform electronic format for consolidation and storage, regardless of the message formats in which the CAT Reporters would

³¹⁵⁷ ICI Letter at 13; Better Markets Letter at 7–8; UnaVista Letter at 2–3.

³¹⁵⁸ Data Boiler Letter at 36.

³¹⁵⁹ See Section IV.D.2, supra, for a complete summary of these comments as well as the Participants' and Commission's responses.

³¹⁶⁰ Data Boiler Letter at 41; FIF Letter at 91; FIX Trading Letter at 1; UnaVista Letter at 2–3; ICI Letter at 13; Better Markets Letter at 7–8.

³¹⁶¹ Data Boiler Letter at 41; FIF Letter at 90–91; FIX Trading Letter at 1; ICI Letter at 13; Better Markets Letter at 7.

³¹⁶² Response Letter I at 29; see also Section IV.D.2, supra, for a complete discussion of the Participants' response.

be required to report data to the Central Repository. The message format(s) ultimately selected for reporting to the Central Repository will be described in the Technical Specifications, which will be approved by the Operating Committee. In addition, the Participants indicated that the Bids of the three remaining Bidders propose accepting existing messaging protocols (e.g., FIX), rather than requiring CAT Reporters to use a new format.³¹⁶³

The Commission has considered the comments and Participants' responses in relation to whether the Plan should mandate a specific approach and believes that there are certain costs and benefits associated with mandating the approach in the Plan and that not mandating the approach is a source of uncertainty in assessing the economic effects of the Plan. The Commission believes that the risks to the implementation schedule (and therefore an increase in implementation costs) of not mandating an approach would be lower if CAT Reporters could submit their reports to CAT in the message protocols they currently use for business purposes because such implementation would involve updating current systems rather than building new systems. The Commission understands from the Participants' response that all remaining Bidders would have within the Plan Processor the ability to accept existing message protocols. Therefore, those CAT Reporters currently using the messaging protocols accepted by the eventual Plan Processor would not need to make significant systems changes. However, the Commission recognizes that the mixed information regarding the economic effects of particular approaches or formats reflects the level of uncertainty in the range of benefits and costs associated with the selection of data ingestion formats and thus the impact of the lack of transparency in the Plan on this economic analysis.

³¹⁶³ Response Letter III at 13.

In response to the comment that the costs of the two approaches should be similar, the Commission notes that the costs of the approaches do not seem consistent with the comment. Whereas the commenter's statements would suggest that the costs of message protocols would be lower for broker-dealers, vendors, and SROs, and higher for building and operating the Central Repository, and similar in aggregate, the costs actually appear similar for each survey group. Therefore, the Commission continues to recognize that the survey result indicating that the costs of the approaches are similar does not seem intuitive.

Finally, the Commission notes the potential for the Plan Processor to use the opportunity to select a message format that entrenches itself by increasing the costs of replacement due to underperformance.³¹⁶⁴ However, as explained above and in Section IV.D.2 the Participants will consider whether a Bidder has proposed a format that is easily understood and adoptable by the industry, and the Commission believes that the message format decision must be made in connection with developing the overall architecture for CAT.

c. Process to Develop CAT

In the Notice, the Commission requested comment on whether the CAT NMS Plan should mandate a particular development process and the impact on the relative costs and benefits of particular processes.³¹⁶⁵ Bidders proposed, and the Plan describes, several processes for development of the CAT: the agile or iterative development model, the waterfall model, and

³¹⁶⁴ See Section V.I.4.b.(2), supra, for a discussion of how the costs of switching Plan Processors limits the competitive incentives of the selected Plan Processor and of the provisions that promote good performance by the Plan Processor.

³¹⁶⁵ See Notice supra note 5, at 30781.

hybrid models.³¹⁶⁶ The CAT NMS Plan does not mandate a particular development process because any of the options could be utilized to manage the development of CAT.³¹⁶⁷ The CAT NMS Plan notes that the agile model is more flexible and more susceptible to the early delivery of software for testing and feedback, but that the agile model makes it more difficult to accurately estimate the effort and time required for development. The waterfall model would also facilitate longer-term planning and coordination among multiple vendors or project streams.³¹⁶⁸

Two commenters suggested that the Plan not mandate a particular development method.³¹⁶⁹ One commenter stated that “appropriate management flexibilities/discretions are needed.”³¹⁷⁰ The other commenter cited bidder expertise and that the Plan Processor should be allowed to choose the “methodology most appropriate for the specific development effort.”³¹⁷¹ The commenter continued on to say that “the different development methodologies can each be equally effective in an implementation plan, depending on many factors and tradeoffs.” While providing information on the costs of mandating a method, neither provided relative costs and benefits of specific methods.

³¹⁶⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section D.12(g). An agile methodology is an iterative model in which development is staggered and provides for continuous evolution of requirements and solutions. A waterfall model is a sequential process of software development with dedicated phases for Conception, Initiation, Analysis, Design, Construction, Testing, Production/Implementation and Maintenance. Id.

³¹⁶⁷ Id.

³¹⁶⁸ Id.

³¹⁶⁹ FIF Letter at 49; Data Boiler Letter at 42.

³¹⁷⁰ Data Boiler Letter at 42.

³¹⁷¹ FIF Letter at 49.

Based on these comments, the Commission believes that mandating a specific development process in the Plan could be costly because mandating the process removes the ability for the Plan Processor to select the lowest cost or most effective methodology for a given implementation. The Commission recognizes that the Plan will involve one big implementation initially, but may also involve many subsequent implementations based on amendments to the Plan or changes in the technical specifications. The nature of these implementations could vary greatly and the same development methodology may not be most effective in all situations. Therefore, the Commission recognizes that mandating a specific development process would be costly.

d. User Support and Help Desk

In the Notice, the Commission requested comment on whether the CAT NMS Plan should specify the standards for user support and on the relative costs and benefits of the alternative standards.³¹⁷² The CAT NMS Plan discusses several alternatives related to how the Plan Processor provides a CAT help desk that would be available 24 hours a day, 7 days a week and be able to manage 2,500 calls per month.³¹⁷³ Specifically, alternatives relate to the number of user support staff members, the degree to which the support team is dedicated to CAT, and whether the help desk is located in the United States or offshore. The CAT NMS Plan discusses the benefit and cost tradeoffs,³¹⁷⁴ but does not mandate any of the particular alternatives.

³¹⁷² See Notice, supra note 5, at 30781.

³¹⁷³ See CAT NMS Plan, supra note 5, at Appendix C, Section D.12(j). The RFP specified these standards. Id.

³¹⁷⁴ See id. The Plan states that a larger support staff could be more effective, but would be more costly. Further, a dedicated CAT support team would have a deeper knowledge of CAT but would be more costly. Finally, a U.S.-based help desk could facilitate greater security and higher quality service, but would be more costly. Id.

Instead, the CAT NMS Plan commits to considering each Bidder’s user support proposals in the context of the overall Bid.

Two commenters addressed alternatives regarding user support and a help desk.³¹⁷⁵ One commenter recommended that customer support guidelines and functionalities be specified in the Plan³¹⁷⁶ while the other suggested that the costs of user support and a help desk could be “minimized or eliminated” under different data collection and reporting methods.³¹⁷⁷ The commenter that supported specifying guidelines and functionalities in the Plan stated that “the level of service provided is directly tied to the industry’s ability to meet the aggressive quality goals and error rates, and directly tied to customer service costs in bidders’ proposals, and ultimately in costs to be borne by the industry.” Therefore, the commenter said they “should be dictated by the Plan and not left to Plan Processor discretion.” Rather than focus on the size and location of the support team and whether the team is dedicated to CAT, the commenter suggests specific standards and functionalities such as wait times, a tracking system, and the ability for web submission or “on-line chat.”

In their response, the Participants clarified that the CAT Help Desk staff will be trained to support CAT Reporters as needed, and noted that this may include, for example, training related to data access tools, data submission requirements, and customer support.³¹⁷⁸

The Commission has considered these comments and recognizes the benefits of the Plan specifying certain functionalities and standards while letting the Plan Processor select the size

³¹⁷⁵ FIF Letter at 125–29; Data Boiler Letter at 42.

³¹⁷⁶ FIF Letter at 125–29.

³¹⁷⁷ Data Boiler Letter at 42.

³¹⁷⁸ See Response Letter I at 38.

and location of the support team necessary to meet these functionalities and standards. In particular, the Commission agrees with the commenter that specifying guidelines and functionalities can facilitate the accomplishment of the benefits described herein and could result in lower costs to the industry relative to the Plan. However, the Commission also agrees that the Plan Processor may be in a better position to determine the size and location of the support team needed to satisfy the guidelines and functionalities.

VI. Paperwork Reduction Act

Certain provisions of Rule 613 contain “collection of information requirements” within the meaning of the Paperwork Reduction Act of 1995 (“PRA”).³¹⁷⁹ The Commission published notice requesting comment on the collection of information requirements in the Notice and submitted the proposed collection to the Office of Management and Budget (“OMB”) for review in accordance with 44 U.S.C. 3507 and 5 CFR 1320.11. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The control number for Rule 613 is OMB Control No. 3235-0671 and the title of the collection of information is “Creation of a Consolidated Audit Trail Pursuant to Section 11A of the Securities Exchange Act of 1934 and Rules Thereunder.” The Commission is adopting this collection of information.

The Commission has amended the CAT NMS Plan, resulting in “a new collection of information” “CAT NMS Plan Reporting and Disclosure Requirements.” The new collection of information is described in Section VI.E., below. The Commission is requesting public comment on the new collection of information requirement in this Order. We are applying for an

³¹⁷⁹ 44 U.S.C. 3501 et. seq.

OMB control number for the proposed new collection of information in accordance with 44 U.S.C. 3507(j) and 5 CFR 1320.13, and OMB has not yet assigned a control number to the new collection. Responses to the new collection of information would be mandatory. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

This Order includes the Commission’s estimates of the costs associated with the requirements of Rule 613, as imposed by the CAT NMS Plan. Similarly, the Commission is discussing below its estimates of the burden hours associated with the information collection requirements of the CAT NMS Plan, as filed by the Participants, and as subsequently amended by the Commission.³¹⁸⁰ These estimates are based on the requirements of Rule 613 and take into account the Exemption Order.³¹⁸¹ Information and estimates contained in the CAT NMS Plan that was submitted by the Participants also informed these estimates because they provide a useful, quantified point of reference regarding potential burdens and costs. In the Notice, the Commission requested comment on the collection of information requirements associated with the CAT NMS Plan that were required by Rule 613. As noted above, the Commission received

³¹⁸⁰ See Section VI.E., *infra*.

³¹⁸¹ See Exemption Order, *supra* note 21. The Commission acknowledges that the CAT NMS Plan as filed contains provisions in addition to those required by Rule 613 (*e.g.*, requiring the inclusion of OTC Equity Securities; the availability of historical data for not less than six years in a manner that is directly available and searchable without manual intervention from the Plan Processor; a complete symbology database to be maintained by the Plan Processor, including the historical symbology; as well as issue symbol information and data using the listing exchange symbology format). See CAT NMS Plan, *supra* note 5, at Section 1.1 (defining “Eligible Security” as all NMS securities and all OTC Equity Securities); Section 6.5(b)(1); Appendix C, Section A.1(a); Appendix D, Section 2.

24 comment letters on the Notice.³¹⁸² Although the Commission did not receive any comments on the hourly burdens associated with the information collections required by Rule 613, a number of comments were submitted that addressed the Commission's cost estimates related to these collections.³¹⁸³

A. Summary of Collection of Information under Rule 613

Rule 613 requires that the CAT NMS Plan must provide for an accurate, time-sequenced record of an order's life, from receipt or origination, through the process of routing, modification, cancellation and execution.³¹⁸⁴ The Central Repository, created by the Participants, would be required to receive, consolidate and retain the data required under the Rule.³¹⁸⁵ Such data must be accessible to each Participant, as well as the Commission, for purposes of performing regulatory and oversight responsibilities.³¹⁸⁶

Rule 613 provides that the CAT NMS Plan must require that all Participants that are exchanges, and their members, record and report to the Central Repository certain data for each NMS security registered or listed on a national securities exchange, or admitted to unlisted trading privileges on such exchange, and each Participant that is a national securities association, and its members, record and report for each NMS security for which transaction reports are required to be submitted to the national securities association in a uniform electronic format or in a manner that would allow the Central Repository to convert the data to a uniform electronic

³¹⁸² See supra note 6.

³¹⁸³ In addition to the discussion that follows, the Commission's cost estimates and responses to cost comments are discussed in detail in Section V.F., supra.

³¹⁸⁴ See 17 CFR 242.613(c)(1).

³¹⁸⁵ See 17 CFR 242.613(e)(1).

³¹⁸⁶ See 17 CFR 242.613(e)(1), (e)(2).

format for consolidation and storage. This data must be recorded contemporaneously with the Reportable Event and reported to the Central Repository in no event later than 8:00 a.m. ET on the trading day following the day such information has been recorded by the national securities exchange, national securities association, or member.³¹⁸⁷

Rule 613 also provides that the CAT NMS Plan must require each member of a Participant to record and report to the Central Repository other information which may not be available until later in the clearing process no later than 8:00 a.m. ET on the trading day following the day the member receives such information.³¹⁸⁸ Rule 613 also requires the Participants to provide to the Commission, at least every two years after the effectiveness of the CAT NMS Plan, a written assessment of the operation of the consolidated audit trail.³¹⁸⁹

Rule 613 requires all Participants to make use of the consolidated information, either by each developing and implementing new surveillance systems, or by enhancing existing surveillance systems.³¹⁹⁰ The Rule also requires the CAT NMS Plan to require Participants to submit to the Commission a document outlining the manner in which non-NMS securities and primary market transactions in NMS and non-NMS securities can be incorporated into the consolidated audit trail.³¹⁹¹

³¹⁸⁷ See 17 CFR 242.613(c)(3).

³¹⁸⁸ See 17 CFR 242.613(c)(4).

³¹⁸⁹ See 17 CFR 242.613(b)(6).

³¹⁹⁰ See 17 CFR 242.613(a)(3)(iv).

³¹⁹¹ See 17 CFR 242.613(i).

1. Central Repository

Rule 613 provides that the CAT NMS Plan must require the creation and maintenance of a Central Repository that would be responsible for the receipt, consolidation, and retention of all data submitted by the Participants and their members.³¹⁹² The Rule also requires that the CAT NMS Plan require the Central Repository to retain the information reported pursuant to subparagraphs (c)(7) and (e)(7) of the Rule for a period of not less than five years in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention.³¹⁹³ The Plan Processor is responsible for operating the Central Repository in compliance with the Rule and the CAT NMS Plan. In addition, the Rule provides that the CAT NMS Plan must include: policies and procedures to ensure the security and confidentiality of all information submitted to the Central Repository,³¹⁹⁴ including safeguards to ensure the confidentiality of data;³¹⁹⁵ information barriers between regulatory and non-regulatory staff with regard to access and use of data;³¹⁹⁶ a mechanism to confirm the identity of all persons permitted to use the data;³¹⁹⁷ a comprehensive information security program for the Central Repository that is subject to regular reviews by the CCO;³¹⁹⁸ and penalties for non-compliance

³¹⁹² See 17 CFR 242.613(e)(1).

³¹⁹³ See 17 CFR 242.613(e)(8). The Commission notes that the CAT NMS Plan proposes to require that the Central Repository retain data reported in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention for six years. See CAT NMS Plan, supra note 5, at Section 6.5(b)(i).

³¹⁹⁴ See 17 CFR 242.613(e)(4)(i).

³¹⁹⁵ See 17 CFR 242.613(e)(4)(i)(A).

³¹⁹⁶ See 17 CFR 242.613(e)(4)(i)(B).

³¹⁹⁷ See 17 CFR 242.613(e)(4)(i)(C).

³¹⁹⁸ Id.

with policies and procedures of the Participants or the Central Repository with respect to information security.³¹⁹⁹ Further, the Rule provides that the CAT NMS Plan must include policies and procedures to be used by the Plan Processor to ensure the timeliness, accuracy, integrity, and completeness of the data submitted to the Central Repository,³²⁰⁰ as well as policies and procedures to ensure the accuracy of the consolidation by the Plan Processor of the data.³²⁰¹

2. Data Collection and Reporting

Rule 613 provides that the CAT NMS Plan must require each Participant, and any member of such Participant, to record and electronically report to the Central Repository details for each order and Reportable Event documenting the life of an order through the process of original receipt or origination, routing, modification, cancellation, and execution (in whole or part) for each NMS security.³²⁰² Rule 613 requires the CAT NMS Plan to require each national securities exchange and its members to record and report to the Central Repository the information required by Rule 613(c)(7) for each NMS security registered or listed for trading on an exchange, or admitted to unlisted trading privileges on such exchange.³²⁰³ Rule 613 provides that the CAT NMS Plan must require each Participant that is a national securities association, and its members, to record and report to the Central Repository the information required by Rule 613(c)(7) for each NMS security for which transaction reports are required to be submitted to the

³¹⁹⁹ See 17 CFR 242.613(e)(4)(i)(D).

³²⁰⁰ See 17 CFR 242.613(e)(4)(ii).

³²⁰¹ See 17 CFR 242.613(e)(4)(iii).

³²⁰² See 17 CFR 242.613(c)(1), (c)(5), (c)(6), (c)(7).

³²⁰³ See 17 CFR 242.613(c)(1), (c)(5).

Participant.³²⁰⁴ The Rule requires each Participant and any member of a Participant to record the information required by Rule 613(c)(7)(i) through (v) contemporaneously with the Reportable Event, and to report this information to the Central Repository by 8:00 a.m. ET on the trading day following the day such information has been recorded by the Participant or member of the Participant.³²⁰⁵ The Rule requires each Participant and any member of a Participant to record and report the information required by Rule 613(c)(7)(vi) through (viii) to the Central Repository by 8:00 a.m. ET on the trading day following the day the Participant or member receives such information.³²⁰⁶ The Rule requires each Participant and any member of such Participant to report information required by Rule 613(c)(7) in a uniform electronic format or in a manner that would allow the Central Repository to convert the data to a uniform electronic format for consolidation and storage.³²⁰⁷

Such information must also be reported to the Central Repository with a timestamp of a granularity that is at least to the millisecond or less to the extent that the order handling and execution systems of a Participant or a member utilize timestamps in finer increments.³²⁰⁸ The Commission understands that any changes to broker-dealer recording and reporting systems to comply with Rule 613 may also include changes to comply with the millisecond timestamp requirement.

³²⁰⁴ See 17 CFR 242.613(c)(1), (c)(6).

³²⁰⁵ See 17 CFR 242.613(c)(3).

³²⁰⁶ See 17 CFR 242.613(c)(4).

³²⁰⁷ See 17 CFR 242.613(c)(2).

³²⁰⁸ See 17 CFR 242.613(d)(3).

3. Collection and Retention of National Best Bid and National Best Offer, Last Sale Data and Transaction Reports

Rule 613(e)(7) provides that the CAT NMS Plan must require the Central Repository to collect and retain on a current and continuing basis: (i) information on the National Best Bid and National Best Offer (“NBBO”) for each NMS Security; (ii) transaction reports reported pursuant to a transaction reporting plan filed with the Commission pursuant to, and meeting the requirements of, Rule 601 of Regulation NMS; and (iii) Last Sale Reports reported pursuant to the OPRA Plan.³²⁰⁹ The Central Repository must retain this information for no less than five years.³²¹⁰

4. Surveillance

Rule 613(f) provides that the CAT NMS Plan must require that every Participant develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the consolidated audit trail. Rule 613(a)(3)(iv) provides that the CAT NMS Plan must require that the surveillance systems be implemented within fourteen months after effectiveness of the CAT NMS Plan.

5. Participant Rule Filings

Rule 613(g)(1) requires each Participant to file with the Commission, pursuant to Section 19(b)(2) of the Exchange Act and Rule 19b-4 thereunder,³²¹¹ a proposed rule change to require its members to comply with the requirements of Rule 613 and the CAT NMS Plan approved by the Commission.³²¹² The burden of filing such a proposed rule change is already

³²⁰⁹ See 17 CFR 242.613(e)(7); 17 CFR 242.601.

³²¹⁰ See 17 CFR 242.613(e)(8).

³²¹¹ 15 U.S.C. 78s(b)(2); 17 CFR 240.19b-4.

³²¹² See 17 CFR 242.613(g)(1).

included under the collection of information requirements contained in Rule 19b-4 under the Exchange Act.³²¹³

6. Document on Expansion to Other Securities

Rule 613(i) provides that the CAT NMS Plan must require the Participants to jointly provide to the Commission, within six months after the CAT NMS Plan is effective, a document outlining how the Participants could incorporate into the CAT information regarding: (1) equity securities that are not NMS securities;³²¹⁴ (2) debt securities; and (3) primary market transactions in equity securities that are not NMS securities and in debt securities.³²¹⁵

7. Written Assessment of Operation of the Consolidated Audit Trail

Rule 613(b)(6) provides that the CAT NMS Plan must require the Participants to provide the Commission a written assessment of the consolidated audit trail's operation at least every two years, once the CAT NMS Plan is effective.³²¹⁶ Such written assessment shall include, at a minimum, with respect to the CAT: (i) an evaluation of its performance; (ii) a detailed plan for any potential improvements to its performance; (iii) an estimate of the costs associated with any such potential improvements; and (iv) an estimated implementation timeline for any such

³²¹³ See Securities Exchange Act Release No. 50486 (October 5, 2004), 69 FR 60287, 60293 (October 8, 2004) (File No. S7-18-04) (describing the collection of information requirements contained in Rule 19b-4 under the Exchange Act). The Commission has submitted revisions to the current collection of information titled "Rule 19b-4 Filings with Respect to Proposed Rule Changes by Self-Regulatory Organizations" (OMB Control No. 3235-0045). According to the last submitted revision, for Fiscal Year 2012 SROs submitted 1,688 Rule 19b-4 proposed rule changes.

³²¹⁴ As noted above, the CAT NMS Plan would require the inclusion of OTC Equity Securities, while Rule 613 does not include such a requirement. See *supra* note 3181.

³²¹⁵ See 17 CFR 242.613(i).

³²¹⁶ See 17 CFR 242.613(b)(6).

potential improvements, if applicable.³²¹⁷ As required by Rule 613(b)(6), the Participants submitted a CAT NMS Plan that includes these minimum requirements. The Commission is subsequently amending the requirements set forth in the CAT NMS Plan to change the reporting frequency from every two years to annual, as well as to provide additional specificity regarding the elements of the written assessment.³²¹⁸ As amended, the annual written assessment must include the following: (i) an evaluation of the information security program of the CAT to ensure that the program is consistent with the highest industry standards for protection of data; (ii) an evaluation of potential technological upgrades based upon a review of technological advancements over the preceding year, drawing on technology expertise, whether internal or external; (iii) an evaluation of the time necessary to restore and recover CAT Data at a back-up site; (iv) an evaluation of how the Plan Processor and Participants are monitoring Error Rates and to explore the imposition of Error Rates based on product, data element or other criteria; (v) a copy of the evaluation required by the CAT NMS Plan in Section 6.8(c) of the Plan that the Plan Processor evaluate whether industry standards have evolved such that: (1) the synchronization standard in Section 6.8(a) of the CAT NMS Plan should be shortened; or (2) the required timestamp in Section 6.8(b) of the CAT NMS Plan should be in finer increments; and (vi) an assessment of whether any data elements reported to the CAT should be added, deleted or changed; and (vii) an estimate of the costs and benefits associated with any potential improvements to the performance of the CAT, including an assessment of the potential impact on competition, efficiency, capital formation, and investor protection.

³²¹⁷ See id.

³²¹⁸ See Section IV.H., supra.

B. Proposed Use of Information

1. Central Repository

Rule 613 states that the Central Repository is required to receive, consolidate and retain the data required to be submitted by the Participants and their members.³²¹⁹ Participant and Commission staff would have access to the data for regulatory purposes.³²²⁰

2. Data Collection and Reporting

The Commission believes that the data collected and reported pursuant to the requirements of Rule 613 would be used by regulators to monitor and surveil the securities markets and detect and investigate activity, whether on one market or across markets. The data collected and reported pursuant to Rule 613 would also be used by regulators for the evaluation of tips and complaints and for complex enforcement inquiries or investigations, as well as inspections and examinations. Further, the Commission believes that regulators would use the data collected and reported to conduct timely and accurate analysis of market activity for reconstruction of broad-based market events in support of regulatory decisions.

3. Collection and Retention of NBBO, Last Sale Data and Transaction Reports

The CAT NMS Plan must require the Central Repository to collect and retain NBBO information, transaction reports, and Last Sale Reports in a format compatible with the order and event information collected pursuant to Rule 613(c)(7).³²²¹ Participant and Commission staff could use this data to easily search across order, NBBO, and transaction databases. The Commission believes that having the NBBO information in a uniform electronic format

³²¹⁹ See 17 CFR 242.613(e)(1).

³²²⁰ See 17 CFR 242.613(e)(2).

³²²¹ See 17 CFR 242.613(e)(7).

compatible with order and event information would assist Participants in enforcing compliance with federal securities laws, rules, and regulations, as well as their own rules.³²²² The Commission also believes that a CAT NMS Plan requiring the Central Repository to collect and retain the transaction reports and Last Sale Reports in a format compatible with the order execution information would aid regulators in monitoring for certain market manipulations.³²²³

4. Surveillance

The requirement in Rule 613(f) that the Participants develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information in the consolidated audit trail,³²²⁴ is intended to position regulators to make full use of the consolidated audit trail data in order to carry out their regulatory obligations. In addition, because trading and potentially manipulative activities could take place across multiple markets, and the consolidated audit trail data would trace the entire

³²²² The Commission and Participants use the NBBO to, among other things, evaluate members for compliance with numerous regulatory requirements, such as the duty of best execution or Rule 611 of Regulation NMS. See 17 CFR 242.611; see also, e.g., ISE Rule 1901 and Phlx Rule 1084.

³²²³ Rules 613(e)(7)(ii) and (iii) require that transaction reports reported pursuant to an effective transaction reporting plan and Last Sale Reports reported pursuant to the OPRA Plan be reported to the Central Repository. This requirement should allow regulators to evaluate certain trading activity. For example, trading patterns of reported and unreported trades may cause Participant or Commission staff to make further inquiries into the nature of the trading to ensure that the public was receiving accurate and timely information regarding executions and that market participants were continuing to comply with trade reporting obligations under Participant rules. Similarly, patterns in the transactions that are reported and unreported to the consolidated tape could be indicia of market abuse, including failure to obtain best execution for customer orders or possible market manipulation. The Commission and the Participants would be able to review information on trades not reported to the tape to determine whether they should have been reported, whether Section 31 fees should have been paid, and/or whether the trades are part of a manipulative scheme.

³²²⁴ 17 CFR 242.613(f).

lifecycle of an order from origination to execution or cancellation, new or enhanced surveillance systems may also enable regulators to investigate potentially illegal activity that spans multiple markets more efficiently.

5. Document on Expansion to Other Securities

Rule 613(i) requires the CAT NMS Plan to require the Participants to jointly provide to the Commission, within six months after the CAT NMS Plan is effective, a document outlining how the Participants could incorporate into the CAT information regarding certain products that are not NMS securities.³²²⁵ A document outlining a possible expansion of the consolidated audit trail could help inform the Commission about the Participants' strategy for potentially accomplishing such an expansion over a reasonable period of time. Moreover, such document would aid the Commission in assessing the feasibility and impact of possible future proposals by the Participants to include such additional securities and transactions in the consolidated audit trail.

6. Written Assessment of Operation of the Consolidated Audit Trail

Rule 613(b)(6) requires the CAT NMS Plan to require the Participants to provide the Commission a written assessment of the CAT's operation at least every two years, once the CAT NMS Plan is effective that includes a plan for potential improvements, an estimate of the costs associated with any such improvement, as well as the potential impact on competition, efficiency and capital formation, and a timeline.³²²⁶ The Commission has subsequently modified this requirement as imposed by the CAT NMS Plan to change the reporting frequency to annual and require that the written assessment include the benefits of any potential improvements and the

³²²⁵ See 17 CFR 242.613(i); see also *supra* note 439.

³²²⁶ 17 CFR 242.613(b)(6).

impact on investor protection, as well as to provide more specificity on what the assessment must address.³²²⁷ The assessment is now required to include evaluations of the following: the information security program; potential technological upgrades; the time to restore and recover CAT Data at a back-up site; how the Plan Processor and the Participants are monitoring Error Rates and exploring imposing Error Rates based on other criteria; a copy of the evaluation required in Section 6.8(a) of the CAT NMS Plan that the Plan Processor evaluate whether industry standards have evolved such that: (i) the clock synchronization standard in Section 6.8(a) of the CAT NMS Plan should be shortened; (ii) the required timestamp in Section 6.8(b) of the CAT NMS Plan should be in finer increments; and an assessment of whether any data elements reported to the CAT should be added, deleted or changed. The Commission believes that requiring these specific issues to be addressed in the Participants' annual written assessment will focus the Plan Processor and the Participants on critical technological and other developments, and should help ensure that CAT technology remains up-to-date, resilient and secure, and provides accurate CAT Data. Further, the Commission believes that it is important that the Participants consider not just the costs, but also the potential benefits associated with any improvements to the performance of the CAT, including the impact on investor protection.

C. Respondents

1. National Securities Exchanges and National Securities Associations

The information collection titled "Creation of a Consolidated Audit Trail Pursuant to Section 11A of the Securities Exchange Act of 1934 and Rules Thereunder" and the proposed

³²²⁷ See Section IV.H., *supra*.

information collection apply to the 21 Participants (the 20 national securities exchanges and the one national securities association (FINRA)) currently registered with the Commission.³²²⁸

2. Members of National Securities Exchanges and National Securities Association

The information collection titled “Creation of a Consolidated Audit Trail Pursuant to Section 11A of the Securities Exchange Act of 1934 and Rules Thereunder” also applies to the Participants’ broker-dealer members, that is, Industry Members. The Commission believes that Rule 613 applies to 1,800 broker-dealers. The Commission understands that there are currently 4,138 broker-dealers; however, not all broker-dealers are expected to have CAT reporting obligations. The Participants report that approximately 1,800 broker-dealers currently quote or execute transactions in NMS Securities, Listed Options or OTC Equity Securities and would likely have CAT reporting obligations.³²²⁹

³²²⁸ The Participants are: Bats BZX Exchange, Inc., Bats BYX Exchange, Inc., BOX Options Exchange LLC, C2 Options Exchange, Incorporated, Chicago Board Options Exchange, Incorporated, Chicago Stock Exchange, Inc., Bats EDGA Exchange, Inc., Bats EDGX Exchange, Inc., Financial Industry Regulatory Authority, Inc., International Securities Exchange, LLC, ISE Gemini, LLC, Miami International Securities Exchange LLC, NASDAQ BX, Inc., NASDAQ PHLX LLC, The NASDAQ Stock Market LLC, National Stock Exchange, Inc., New York Stock Exchange LLC, NYSE MKT LLC, and NYSE Arca, Inc. ISE Mercury and IEX will become Participants in the CAT NMS Plan and are thus accounted for as Participants for purposes of this Order. See supra note 10.

³²²⁹ The Commission understands that the remaining 2,338 registered broker-dealers either trade in asset classes not currently included in the definition of Eligible Security or do not trade at all (e.g., broker-dealers for the purposes of underwriting, advising, private placements). See Notice, supra note 5, at 30712, n.864.

D. Total Initial and Annual Reporting and Recordkeeping Burden

1. Burden on National Securities Exchanges and National Securities Associations

a. Central Repository

Rule 613 requires the Participants to jointly establish a Central Repository tasked with the receipt, consolidation, and retention of the reported order and execution information. The Participants reflected this requirement in the CAT NMS Plan. The Participants issued an RFP soliciting Bids from entities to act as the consolidated audit trail's Plan Processor.³²³⁰ Bidders were asked to provide total one-year and annual recurring cost estimates to estimate the costs to the Participants for implementing and maintaining the Central Repository.³²³¹ There are currently three remaining Bidders, any of which could be selected to be the Plan Processor. The Plan Processor would be responsible for building, operating, administering and maintaining the Central Repository.

The Plan's Operating Committee, which consists of one voting representative of each Participant,³²³² would be responsible for the management of the LLC, including the Central Repository, acting by Majority or Supermajority Vote, depending on the issue.³²³³ In managing the Central Repository, among other things, the Operating Committee would have the

³²³⁰ See Notice, supra note 5, at 30616.

³²³¹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B). The CAT NMS Plan listed the following as primary drivers of Bid costs: (1) reportable volumes of data ingested into the Central Repository; (2) number of technical environments that would have to be built to report to the Central Repository; (3) likely future rate of increase of reportable volumes; (4) data archival requirements; and (5) user support and/or help desk resource requirements. Id.

³²³² See id. at Section 4.2(a).

³²³³ See Notice, supra note 5, at 30702.

responsibility to authorize the following actions of the LLC: (1) interpreting the Plan;³²³⁴ (2) determining appropriate funding-related policies, procedures and practices consistent with Article XI of the CAT NMS Plan;³²³⁵ (3) terminating the Plan Processor; (4) selecting a successor Plan Processor (including establishing a Plan Processor Selection Committee to evaluate and review Bids and make a recommendation to the Operating Committee with respect to the selection of the successor Plan Processor);³²³⁶ (5) entering into, modifying or terminating any Material Contract;³²³⁷ (6) making any Material Systems Change;³²³⁸ (7) approving the initial Technical Specifications or any Material Amendment to the Technical Specifications proposed by the Plan Processor;³²³⁹ (8) amending the Technical Specifications on its own motion;³²⁴⁰ (9) approving the Plan Processor's appointment or removal of the CCO, CISO, or any Independent Auditor in accordance with Section 6.1(b) of the CAT NMS Plan;³²⁴¹ (10) approving any recommendation by the CCO pursuant to Section 6.2(a)(v)(A);³²⁴² (11) selecting the members of the Advisory Committee;³²⁴³ (12) selecting the Operating

³²³⁴ See CAT NMS Plan, supra note 5, at Section 4.3(a)(iii).

³²³⁵ See id. at Section 4.3(a)(vi).

³²³⁶ See id. at Section 4.3(b)(i).

³²³⁷ See id. at Section 4.3(b)(iv).

³²³⁸ See id. at Section 4.3(b)(v).

³²³⁹ See id. at Section 4.3(b)(vi).

³²⁴⁰ See id. at Section 4.3(b)(vii).

³²⁴¹ See id. at Section 4.3(b)(iii).

³²⁴² See id. at Section 4.3(a)(iv).

³²⁴³ See id. at Section 4.3(a)(ii). Section 4.13(e) of the CAT NMS Plan states that the members of the Advisory Committee shall have the right to receive information concerning the operation of the Central Repository; provided that the Operating Committee retains the authority to determine the scope and content of information supplied to the Advisory Committee, which shall be limited to that information that is

Committee chair;³²⁴⁴ and (13) determining to hold an Executive Session of the Operating Committee.³²⁴⁵

Additionally, in managing the Central Repository, the Operating Committee would have the responsibility and authority, as appropriate, to: (1) direct the LLC to enter into one or more agreements with the Plan Processor obligating the Plan Processor to perform the functions and duties contemplated by the Plan to be performed by the Plan Processor, as well as such other functions and duties the Operating Committee deems necessary or appropriate;³²⁴⁶ (2) appoint as an Officer of the Company the individual who has direct management responsibility for the Plan Processor's performance of its obligations with respect to the CAT;³²⁴⁷ (3) approve policies, procedures, and control structures related to the CAT System that are consistent with Rule 613(e)(4), Appendix C and Appendix D of the CAT NMS Plan that have been developed and will be implemented by the Plan Processor;³²⁴⁸ (4) approve any policy, procedure or standard (and any material modification or amendment thereto) applicable primarily to the

necessary and appropriate for the Advisory Committee to fulfill its functions. The Commission is amending this section to state that the members of the Advisory Committee shall receive the same information concerning the operation of the Central Repository as the Operating Committee; provided, however, that the Operating Committee may withhold information it reasonably determines requires confidential treatment. See Section IV.B.2, supra. The Commission does not believe this amendment would change the hourly burden or external cost imposed on Participants for management of the Central Repository.

³²⁴⁴ See id. at Section 4.3(a)(i).

³²⁴⁵ See id. at Section 4.3(a)(v).

³²⁴⁶ See id. at Section 6.1(a).

³²⁴⁷ See id. at Section 4.6(b).

³²⁴⁸ See id. at Section 6.1(c).

performance of the Plan Processor’s duties as the Plan Processor;³²⁴⁹ (5) for both the CCO and CISO, render their annual performance reviews and review and approve their compensation;³²⁵⁰ (6) review the Plan Processor’s performance under the Plan at least once each year, or more often than once each year upon the request of two or more Participants that are not Affiliated Participants;³²⁵¹ (7) in conjunction with the Plan Processor, approve and regularly review (and update as necessary) SLAs governing the performance of the Central Repository;³²⁵² (8) maintain a Compliance Subcommittee for the purpose of aiding the CCO as necessary;³²⁵³ and (9) designate by resolution one or more Subcommittees it deems necessary or desirable in furtherance of the management of the business and affairs of the Company.³²⁵⁴

The CAT NMS Plan will also establish a Selection Committee comprised of one Voting Senior Officer from each Participant,³²⁵⁵ which is tasked with the review and evaluation of Bids and the selection of the Initial Plan Processor.³²⁵⁶ The Selection Committee would determine, by Majority Vote, whether Shortlisted Bidders will have the opportunity to revise their Bids.³²⁵⁷ The Selection Committee would review and evaluate all Shortlisted Bids, including any permitted revisions submitted by Shortlisted Bidders, and in doing so, may consult with the Advisory Committee (or the DAG until the Advisory Committee is formed) and such other

³²⁴⁹ See id. at Section 6.1(e).

³²⁵⁰ See id. at Section 6.2(a)(iv), (b)(iv).

³²⁵¹ See id. at Section 6.1(n).

³²⁵² See id. at Section 6.1(h).

³²⁵³ See id. at Section 4.12(b).

³²⁵⁴ See id. at Section 4.12(a).

³²⁵⁵ See id. at Section 5.1(a).

³²⁵⁶ See id. at Section 5.1.

³²⁵⁷ See id. at Section 5.2(d)(i).

Persons as the Selection Committee deems appropriate.³²⁵⁸ After receipt of any permitted revisions, the Selection Committee would select the Initial Plan Processor from the Shortlisted Bids in two rounds of voting where each Participant has one vote via its Voting Senior Officer in each round.³²⁵⁹ Following the selection of the Initial Plan Processor, the Participants would file with the Commission a statement identifying the Initial Plan Processor and including the information required by Rule 608.³²⁶⁰

For its initial and ongoing internal burden and cost estimates associated with the management of the Central Repository, the Commission is relying on estimates provided in the CAT NMS Plan for the development of the CAT NMS Plan, which the Participants “have accrued, and will continue to accrue,”³²⁶¹ and have described in the CAT NMS Plan as “reasonably associated with creating, implementing, and maintaining the CAT upon the Commission’s adoption of the CAT NMS Plan.”³²⁶²

The Commission believes that the activities of the Operating Committee and the Selection Committee overlap with those undertaken by the Participants to develop the CAT NMS Plan. The CAT NMS Plan describes the costs incurred by the Participants to develop the CAT NMS Plan as including “staff time contributed by each Participant to, among other things, determine the technological requirements for the Central Repository, develop the RFP, evaluate Bids received, design and collect the data necessary to evaluate costs and other economic

³²⁵⁸ See id. at Section 5.2(d)(ii).

³²⁵⁹ See id. at Section 5.1(e).

³²⁶⁰ See id. at Section 6.7(a)(i).

³²⁶¹ See id. at Appendix C, Section B.7(b)(iii).

³²⁶² See id.

impacts, meet with Industry Members to solicit feedback, and complete the CAT NMS Plan submitted to the Commission for consideration.”³²⁶³ For the building and management of the Central Repository, the Selection Committee and the Operating Committee would have comparable responsibilities. The Selection Committee would be required to review and evaluate all Shortlisted Bids, including any permitted revisions submitted by Shortlisted Bidders, and then to select the Initial Plan Processor from those Bids. As part of its overall management of the Central Repository, the Operating Committee would have responsibility for decisions associated with the technical requirements of the Central Repository.³²⁶⁴ Furthermore, the Operating Committee would be required to establish a Selection Committee to evaluate Bids received to select a successor Plan Processor,³²⁶⁵ and would also be required to authorize the selection of the members of the Advisory Committee,³²⁶⁶ comprising members of the industry, to advise the Participants on the implementation, operation, and administration of the Central Repository.³²⁶⁷ Because the responsibilities of the Operating Committee and the Selection Committee are similar

³²⁶³ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii).

³²⁶⁴ For example, the Operating Committee would be required to authorize the following actions of the LLC: entering into, modifying or terminating any Material Contract (see id. at Section 4.3(b)(iv)); making any Material Systems Change (see id. at Section 4.3(b)(v)); amending the Technical Specifications on its own motion (see id. at Section 4.3(b)(vii)); and approving the initial Technical Specifications or any Material Amendment to the Technical Specifications proposed by the Plan Processor (see id. at Section 4.3(b)(vi)). Further, the Operating Committee would be able to approve policies, procedures, and control structures related to the CAT System that are consistent with Rule 613(e)(4), Appendix C and Appendix D of the CAT NMS Plan that have been developed and will be implemented by the Plan Processor (see id. at Section 6.1(c)); and in conjunction with the Plan Processor, approve and regularly review (and update as necessary) SLAs governing the performance of the Central Repository (see id. at Section 6.1(h)).

³²⁶⁵ See id. at Section 4.3(b)(i).

³²⁶⁶ See id. at Section 4.3(a)(ii).

³²⁶⁷ See id. at Section 4.13(d).

to those described in the CAT NMS Plan for the development of the CAT NMS Plan itself, the Commission believes that it is reasonable to use the CAT NMS Plan estimates as the basis for its burden and cost estimates for the initial and ongoing management of the Central Repository.

(1) Initial Burden and Costs to Build the Central Repository

Each Participant would contribute an employee and a substitute for the employee to serve on the Operating Committee that would oversee the Central Repository.³²⁶⁸ Additionally, each Participant would select a Voting Senior Officer to represent the Participant as a member of the Selection Committee responsible for the selection of the Plan Processor of the Central Repository.³²⁶⁹

A. Notice Estimates – Initial Burden and Costs

In the Notice, the Commission preliminarily estimated that, over the 12-month period after the effectiveness of the CAT NMS Plan within which the Participants would be required to select an Initial Plan Processor³²⁷⁰ and begin reporting to the Central Repository,³²⁷¹ each Participant would incur an initial internal burden of 720 burden hours associated with the

³²⁶⁸ In the case of Affiliated Participants, one individual may be the primary representative for all or some of the Affiliated Participants, and another individual may be the substitute for all or some of the Affiliated Participants. See id. at Section 4.2(a).

³²⁶⁹ In the case of Affiliated Participants, one individual may be (but is not required to be) the Voting Senior Officer for more than one or all of the Affiliated Participants. Where one individual serves as the Voting Senior Officer for more than one Affiliated Participant, such individual will have the right to vote on behalf of each such Affiliated Participant. See id. at Section 5.1(a).

³²⁷⁰ Rule 613(a)(3)(i) requires the selection of the Plan Processor within 2 months after effectiveness of the CAT NMS Plan. See 17 CFR 242.613(a)(3)(i).

³²⁷¹ Rule 613(a)(3)(iii) requires the Participants to provide to the Central Repository the data required by Rule 613(c) within one year after effectiveness of the CAT NMS Plan. See 17 CFR 242.613(a)(3)(iii).

management of the creation of the Central Repository and the selection of the Plan Processor (including filing with the Commission the statement identifying the Initial Plan Processor and including the information required by Rule 608), for an aggregate initial estimate of 14,407 burden hours.³²⁷²

Additionally, the Commission preliminarily estimated that the Participants would collectively spend \$2,400,000 on external public relations, legal and consulting costs associated with building the Central Repository and the selection of the Plan Processor for the Central Repository, or \$120,000 per Participant.³²⁷³ The Commission based this estimate on the estimate provided in the CAT NMS Plan for public relations, legal and consulting costs incurred in

³²⁷² The Commission based this estimate on the internal burden estimate provided in the CAT NMS Plan related to the development of the CAT NMS Plan. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating “...the Participants have accrued, and will continue to accrue, direct costs associated with the development of the CAT NMS Plan. These costs include staff time contributed by each Participant to, among other things, determine the technological requirements for the Central Repository, develop the RFP, evaluate Bids received, design and collect the data necessary to evaluate costs and other economic impacts, meet with Industry Members to solicit feedback, and complete the CAT NMS Plan submitted to the Commission for consideration. The Participants estimated that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process”). The Commission believed the staff time incurred for the development of the CAT NMS Plan would be comparable to the staff time incurred for the activities required of the Operating Committee and the Selection Committee for the creation and management of the Central Repository once the Plan is effective. $(20 \text{ FTEs} / 30 \text{ months}) = 0.667 \text{ FTEs per month}$ for all of the Participants to develop the CAT NMS Plan. Converting this into burden hours, $(0.667 \text{ FTEs}) \times (12 \text{ months}) \times (1,800 \text{ burden hours per year}) = 14,407 \text{ initial burden hours}$ for all of the Participants to develop the CAT NMS Plan. $(14,407 \text{ burden hours for all Participants} / 20 \text{ Participants}) = 720 \text{ initial burden hours}$ for each Participant to develop the CAT NMS Plan.

³²⁷³ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating “the Participants have incurred public relations, legal and consulting costs in preparation of the CAT NMS Plan. The Participants estimated the costs of these services to be \$8,800,000”). $\$2,400,000 \text{ for all Participants over 12 months} = (\$8,800,000 / 44 \text{ months between the adoption of Rule 613 and the filing of the CAT NMS Plan}) \times (12 \text{ months})$. $(\$2,400,000 / 20 \text{ Participants}) = \$120,000 \text{ per Participant over 12 months}$.

preparation of the CAT NMS Plan. Because the Participants described such costs as “reasonably associated with creating, implementing and maintaining the CAT,”³²⁷⁴ the Commission preliminarily believed these external cost estimates should also be applied to the creation and implementation of the Central Repository.

Using the estimates in the CAT NMS Plan, which are based on the Bids of the six Shortlisted Bidders,³²⁷⁵ the Commission preliminarily estimated that the initial one-time cost to develop the Central Repository would be an aggregate initial external cost to the Participants of \$91.6 million,³²⁷⁶ or \$4.6 million per Participant.³²⁷⁷ The Commission preliminarily estimated

³²⁷⁴ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii).

³²⁷⁵ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B). See also id. at Appendix C, Section B.7(b)(iv)(A)(1). The Commission noted that the cost associated with the build and maintenance of the Central Repository includes compliance with the requirement in Rule 613(e)(8) that the Central Repository retain information collected pursuant to Rule 613(c)(7) and (e)(7) in a convenient and usable standard electronic data format that is directly available and searchable electronically without any manual intervention for a period of not less than five years. See id. at Section 6.1(d)(i) (requiring the Plan Processor to comply with the recordkeeping requirements of Rule 613(e)(8)). See also id. at Appendix C, Section D.12(1) (stating that Rule 613(e)(8) requires data to be available and searchable for a period of not less than five years, that broker-dealers are currently required to retain data for six years under Rule 17a-4(a), and that the Participants are requiring CAT Data to be kept online in an easily accessible format for regulators for six years, though this may increase the cost to run the CAT). The Commission notes that changes in technology between the time the Bids were submitted and the time the Central Repository is built could result in changes to the costs to build and operate the Central Repository.

³²⁷⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B) (describing the minimum, median, mean and maximum Bidder estimates for the build and maintenance costs of the Central Repository).

³²⁷⁷ Id. The Bidders provided a range of estimates. For purposes of this Paperwork Burden Act analysis, the Commission used the build cost of the maximum Bidder estimate. $\$4,580,000 = \$91,600,000/20$ SROs.

that each Participant would incur initial one-time external costs of \$7 million³²⁷⁸ to build the Central Repository, or an aggregate initial one-time external cost across all Participants of \$140 million.³²⁷⁹ The estimates in the CAT NMS Plan, as well as the Commission’s preliminary estimate includes internal technological, operational, administrative and “any other material costs.”³²⁸⁰

B. Order Estimates – Initial Burden and Costs

Subsequent to the publication of the Notice, the Participants submitted revised Central Repository cost estimates to reflect the proposed development and maintenance costs of the final three Shortlisted Bidders.³²⁸¹ In addition, with the registration of IEX as a national securities exchange in June 2016,³²⁸² the expected number of Participants has increased from 20 to 21. As a result, the Commission is modifying its estimates of the initial burden and costs of the Central Repository.

After incorporating the revisions to the Central Repository cost estimates and the increase in the number of Participants, the Commission now estimates that, over the 12-month period after the effectiveness of the CAT NMS Plan within which the Participants would be required to

³²⁷⁸ \$7 million for each Participant to build the Central Repository = (\$4.6 million per Participant in initial one-time costs to compensate the Plan Processor to build the Central Repository) + (\$2.4 million per Participant in initial one-time public relations, legal and consulting costs associated with the building of the Central Repository and the selection of the Initial Plan Processor).

³²⁷⁹ \$140 million for all of the Participants to build the Central Repository = \$7 million per Participant to build the Central Repository) x (20 Participants). Id.

³²⁸⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B).

³²⁸¹ See Response Letter III at 14–15.

³²⁸² IEX became a registered national securities exchange on June 17, 2016. See Securities Exchange Act Release No. 78101 (June 17, 2016), 81 FR 41142 (June 23, 2016).

select an Initial Plan Processor³²⁸³ and begin reporting to the Central Repository,³²⁸⁴ each Participant would incur an initial internal burden of 686.05 burden hours associated with the management of the creation of the Central Repository and the selection of the Plan Processor (including filing with the Commission the statement identifying the Initial Plan Processor and including the information required by Rule 608), for an aggregate initial estimate of 14,407 burden hours.³²⁸⁵

The Commission has not changed its estimate that the Participants will collectively spend \$2,400,000 on external public relations, legal and consulting costs associated with the building of

³²⁸³ Rule 613(a)(3)(i) requires the selection of the Plan Processor within 2 months after effectiveness of the CAT NMS Plan. See 17 CFR 242.613(a)(3)(i).

³²⁸⁴ Rule 613(a)(3)(iii) requires the Participants to provide to the Central Repository the data required by Rule 613(c) within one year after effectiveness of the CAT NMS Plan. See 17 CFR 242.613(a)(3)(iii).

³²⁸⁵ The Commission based this estimate on the internal burden estimate provided in the CAT NMS Plan related to the development of the CAT NMS Plan. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating "...the Participants have accrued, and will continue to accrue, direct costs associated with the development of the CAT NMS Plan. These costs include staff time contributed by each Participant to, among other things, determine the technological requirements for the Central Repository, develop the RFP, evaluate Bids received, design and collect the data necessary to evaluate costs and other economic impacts, meet with Industry Members to solicit feedback, and complete the CAT NMS Plan submitted to the Commission for consideration. The Participants estimated that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process"). The Commission believed the staff time incurred for the development of the CAT NMS Plan would be comparable to the staff time incurred for the activities required of the Operating Committee and the Selection Committee for the creation and management of the Central Repository once the Plan is effective). $(20 \text{ FTEs} / 30 \text{ months}) = 0.667 \text{ FTEs per month}$ for all of the Participants to develop the CAT NMS Plan. Converting this into burden hours, $(0.667 \text{ FTEs}) \times (12 \text{ months}) \times (1,800 \text{ burden hours per year}) = 14,407 \text{ initial burden hours}$ for all of the Participants to develop the CAT NMS Plan. $(14,407 \text{ burden hours for all Participants} / 21 \text{ Participants}) = 686.05 \text{ initial burden hours}$ for each Participant associated with the management of the creation of the Central Repository and the selection of the Plan Processor.

the Central Repository. However, the individual Participant cost estimate has decreased from \$120,000 per Participant (as the Commission preliminarily estimated in the Notice³²⁸⁶) to \$114,285.71 per Participant, due to the increase in the number of Participants.³²⁸⁷ As noted in the Notice, the Commission is basing this estimate on the estimate provided in the CAT NMS Plan for public relations, legal and consulting costs incurred in preparation of the CAT NMS Plan. Because the Participants described such costs as “reasonably associated with creating, implementing and maintaining the CAT,”³²⁸⁸ the Commission believes these external cost estimates should also be applied to the creation and implementation of the Central Repository.

As noted above, the Participants updated the Central Repository estimates to reflect the estimates of the final three Shortlisted Bidders.³²⁸⁹ Using the revised estimates, the Commission estimates that the initial one-time cost to develop the Central Repository would be an aggregate initial external cost to the Participants of \$65 million,³²⁹⁰ or \$3,095,238.09 per Participant.³²⁹¹ Therefore, the Commission now estimates that each Participant would incur initial one-time

³²⁸⁶ See Notice, *supra* note 5, at Section V.D.1.a(1).

³²⁸⁷ See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii) (stating “the Participants have incurred public relations, legal and consulting costs in preparation of the CAT NMS Plan. The Participants estimate the costs of these services to be \$8,800,000”). $\$2,400,000$ for all Participants over 12 months = $(\$8,800,000 / 44 \text{ months between the adoption of Rule 613 and the filing of the CAT NMS Plan}) \times (12 \text{ months})$. $(\$2,400,000 / 21 \text{ Participants}) = \$114,285.71$ per Participant over 12 months.

³²⁸⁸ See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii).

³²⁸⁹ See Response Letter III at 14–15.

³²⁹⁰ See *id.*

³²⁹¹ *Id.* The Participants provided a range of Bidder estimates. For purposes of this Paperwork Burden Act analysis, the Commission is using the build cost of the maximum estimate. $\$3,095,238.09 = \$65,000,000 / 21 \text{ Participants}$.

external costs of \$3,209,523.80³²⁹² to build the Central Repository, or an aggregate initial one-time external cost across all Participants of \$67,399,999.80.³²⁹³

(2) Ongoing, Annual Burden Hours and Costs for the Central Repository

After the Central Repository has been developed and implemented, there would be ongoing costs for operating and maintaining the Central Repository, including the cost of systems and connectivity upgrades or changes necessary to receive and consolidate the reported order and execution information from Participants and their members; the cost to store data, and make it available to regulators, in a uniform electronic format, and in a form in which all events pertaining to the same originating order are linked together in a manner that ensures timely and accurate retrieval of the information; the cost of collecting and maintaining the NBBO and transaction data in a format compatible with the order and event information collected pursuant to the Rule; the cost of monitoring the required validation parameters, which would allow the Central Repository to automatically check the accuracy and completeness of the data submitted and reject data not conforming to these parameters consistent with the requirements of the Rule;

³²⁹² \$3,209,523.80 for each Participant to build the Central Repository = (\$3,095,238.09 per Participant in initial one-time costs to compensate the Plan Processor to build the Central Repository) + (\$114,285.71 per Participant in initial one-time public relations, legal and consulting costs associated with the building of the Central Repository and the selection of the Initial Plan Processor).

Commission staff notes that the Notice for the CAT NMS Plan contained an erroneous estimate of the initial one-time external costs to the Participants to build the Central Repository, estimating that each Participant would incur a cost of \$7 million. The correct estimate was \$4,476,190.47 per Participant. However, the Commission has subsequently revised its estimated costs to account for updated estimates provided by the Participants. See supra note 3289.

³²⁹³ \$67,399,999.80 for all of the Participants to build the Central Repository = (\$3,209,523.80 per Participant to build the Central Repository) x (21 Participants).

and the cost of paying the CCO and CISO. The CAT NMS Plan provides that the Plan Processor would be responsible for the ongoing operations of the Central Repository.³²⁹⁴ The Operating Committee would continue to be responsible for the management of the Central Repository. In addition, the CAT NMS Plan states that the Participants would incur costs for public relations, legal, and consulting costs associated with maintaining the CAT upon approval of the CAT NMS Plan.³²⁹⁵

A. Notice Estimates – Ongoing Burden and Costs

In the Notice, the Commission preliminarily estimated that each Participant would incur an ongoing annual internal burden of 720 burden hours associated with the continued management of the Central Repository, for an aggregate annual estimate of 14,407 burden hours across the Participants.³²⁹⁶

³²⁹⁴ See CAT NMS Plan, supra note 5, at Section 6.1.

³²⁹⁵ See id. at Appendix C, Section B.7(b)(iii).

³²⁹⁶ The Commission based this estimate on the internal burden estimate provided in the CAT NMS Plan for the development of the CAT NMS Plan. The Commission noted that the CAT NMS Plan describes the internal burden estimate for the development of the CAT NMS Plan as a cost the Participants will continue to accrue; therefore, the Commission preliminarily believed that it is reasonable to use this burden estimate as the basis for its ongoing internal burden estimate for the maintenance of the Central Repository, particularly as the Commission believed the reasons for the staff time incurred for the development of the CAT NMS Plan would be comparable to those of the staff time to be incurred by the Operating Committee and the Selection Committee for the continued management of the Central Repository. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating "...the Participants have accrued, and will continue to accrue, direct costs associated with the development of the CAT NMS Plan. These costs include staff time contributed by each Participant to, among other things, determine the technological requirements for the Central Repository, develop the RFP, evaluate Bids received, design and collect the data necessary to evaluate costs and other economic impacts, meet with Industry Members to solicit feedback, and complete the CAT NMS Plan submitted to the Commission for consideration. The Participants estimate that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process"). (20 FTEs / 30 months) = 0.667 FTEs per month for all of the

Additionally, the Commission preliminarily estimated that the Participants would collectively spend \$800,000 annually on external public relations, legal and consulting costs associated with the continued management of the Central Repository, or \$40,000 per Participant.³²⁹⁷

The CAT NMS Plan includes the estimates the six Shortlisted Bidders provided for the annual ongoing costs to the Participants to operate the Central Repository.³²⁹⁸ The CAT NMS Plan did not categorize the costs included in the ongoing costs, but the Commission believed they would comprise external technological, operational and administrative costs, as the Participants described the costs included in the initial one-time external cost to build the Central

Participants to continue management of the Central Repository. Converting this into burden hours, $(0.667 \text{ FTEs}) \times (12 \text{ months}) \times (1,800 \text{ burden hours per year}) = 14,407$ ongoing annual burden hours for all of the Participants to continue management of the Central Repository. $(14,407 \text{ ongoing annual burden hours for all Participants} / 20 \text{ Participants}) = 720$ ongoing annual burden hours for each Participant to continue management of the Central Repository.

³²⁹⁷ The Commission based this external cost estimate on the public relations, legal and consulting external cost estimate provided in the CAT NMS Plan associated with the preparation of the CAT NMS Plan (which the Participants consider “reasonably associated with creating, implementing, and maintaining the CAT upon the Commission’s adoption of the CAT NMS Plan”). See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii) (stating “the Participants have incurred public relations, legal and consulting costs in preparation of the CAT NMS Plan. The Participants estimated the costs of these services to be \$8,800,000”). $\$2,400,000$ for all Participants over 12 months = $(\$8,800,000 / 44 \text{ months between the adoption of Rule 613 and the filing of the CAT NMS Plan}) \times (12 \text{ months})$. Because the Central Repository will have already been created, the Commission believed it is reasonable to assume that the Participants will have a lesser need for public relations, legal and consulting services. The Commission estimated that the Participants will incur one-third of the external cost associated with development and implementation of the Central Repository to maintain the Central Repository. $\$800,000 = (0.333) \times (\$2,400,000)$. $(\$800,000 / 20 \text{ Participants}) = \$40,000$ per Participant over 12 months.

³²⁹⁸ See Section V.F.1.a, *supra*, for a discussion of the total five-year operating costs for the Central Repository presented in the CAT NMS Plan. See also CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(i)(B).

Repository.³²⁹⁹ Using these estimates, the Commission preliminarily estimated that the annual ongoing cost to the Participants³³⁰⁰ to compensate the Plan Processor for building, operating and maintaining the Central Repository would be an aggregate ongoing external cost of \$93 million,³³⁰¹ or approximately \$4.7 million per Participant.³³⁰² Therefore, the Commission preliminarily estimated that each Participant would incur ongoing annual external costs of \$4,740,000³³⁰³ to maintain the Central Repository, or aggregate ongoing annual external costs across all Participants of \$94,800,000.³³⁰⁴

³²⁹⁹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B).

³³⁰⁰ See supra note 3276.

³³⁰¹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(B).

³³⁰² The Bidders provided a range of estimates. For purposes of this Paperwork Burden Act analysis, the Commission preliminarily used the maximum operation and maintenance cost estimate. $\$4,650,000 = \$93,000,000 / 20$ Participants. See also Section V.F.1.a, supra. The Commission noted several uncertainties that may affect the Central Repository cost estimates, including (1) that the Participants have not yet selected a Plan Processor and the Shortlisted Bidders have submitted a wide range of cost estimates for building and operating the Central Repository; (2) the Bids submitted by the Shortlisted Bidders may not be final because they may be revised before the final selection of the CAT Processor; and (3) neither the Bidders nor the Commission can anticipate the evolution of technology and market activity with precision, as improvements in available technology may allow the Central Repository to be built and operated at a lower cost than is currently anticipated, but if levels of anticipated market activity are materially underestimated, the capacity of the Central Repository may need to be increased, resulting in an increase in costs.

³³⁰³ $\$4,740,000$ for each Participant to build the Central Repository = ($\$4.7$ million per Participant in ongoing annual costs to build the Central Repository) + ($\$40,000$ per Participant in ongoing annual public relations, legal and consulting costs associated with the maintenance of the Central Repository).

³³⁰⁴ $\$94,800,000$ for all of the Participants to maintain the Central Repository = ($\$4,740,000$ per Participant to compensate the Plan Processor and for external public relations, legal and consulting costs associated with the maintenance of the Central Repository) x (20 Participants).

B. Comments/Responses on Ongoing Costs

One commenter provided an alternate estimate for Central Repository ongoing costs of \$28 million - \$36 million.³³⁰⁵ The commenter did not provide additional information or analysis to support this estimate, but the Commission notes that the commenter cited a study of the costs of the Volcker Rule in support of estimates for costs to Industry Members.³³⁰⁶ If the commenter is basing its estimates on the costs expected from the Volcker Rule, the Commission notes that the requirements of Rule 613 are significantly different than the requirements of the Volcker Rule. The Commission also notes that the estimates provided in the Notice are the result of a competitive bidding process specific to the CAT and the Commission deems them credible.

C. Order Estimates – Ongoing Burden and Costs

As noted above, subsequent to the publication of the Notice, the Participants submitted revised Central Repository cost estimates to reflect the proposed development and maintenance costs of the final three Shortlisted Bidders.³³⁰⁷ In addition, with the registration of IEX as a national securities exchange in June 2016,³³⁰⁸ the expected number of Participants has increased from 20 to 21. As a result, the Commission is modifying its estimates of the ongoing burden and costs of the Central Repository.

After incorporating the revisions to the Central Repository cost estimates and the increase in the number of Participants, the Commission now estimates that each Participant would incur

³³⁰⁵ Data Boiler Letter at 15.

³³⁰⁶ Data Boiler Letter at 15.

³³⁰⁷ See Response Letter III at 14–15. The Commission continues to believe that estimating Central Repository costs using estimates from the Bids is reliable and is therefore updating its cost estimates to reflect the updates provided by the Participants.

³³⁰⁸ See supra note 3282.

an ongoing annual internal burden of 686.05 burden hours associated with the continued management of the Central Repository, for an aggregate annual estimate of 14,407 burden hours across the Participants.³³⁰⁹

The Commission has not changed its estimate that the Participants would collectively spend \$800,000 annually on external public relations, legal and consulting costs associated with the continued management of the Central Repository. However, the individual Participant cost estimate has decreased from \$40,000 per Participant (as the Commission preliminarily estimated

³³⁰⁹ The Commission is basing this estimate on the internal burden estimate provided in the CAT NMS Plan for the development of the CAT NMS Plan. The Commission notes that the CAT NMS Plan describes the internal burden estimate for the development of the CAT NMS Plan as a cost the Participants will continue to accrue; therefore, the Commission believes that it is reasonable to use this burden estimate as the basis for its ongoing internal burden estimate for the maintenance of the Central Repository, particularly as the Commission believes the reasons for the staff time incurred for the development of the CAT NMS Plan would be comparable to those of the staff time to be incurred by the Operating Committee and the Selection Committee for the continued management of the Central Repository. *See* CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii) (stating "...the Participants have accrued, and will continue to accrue, direct costs associated with the development of the CAT NMS Plan. These costs include staff time contributed by each Participant to, among other things, determine the technological requirements for the Central Repository, develop the RFP, evaluate Bids received, design and collect the data necessary to evaluate costs and other economic impacts, meet with Industry Members to solicit feedback, and complete the CAT NMS Plan submitted to the Commission for consideration. The Participants estimate that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process"). $(20 \text{ FTEs} / 30 \text{ months}) = 0.667 \text{ FTEs per month}$ for all of the Participants to continue management of the Central Repository. Converting this into burden hours, $(0.667 \text{ FTEs}) \times (12 \text{ months}) \times (1,800 \text{ burden hours per year}) = 14,407$ ongoing annual burden hours for all of the Participants to continue management of the Central Repository. $(14,407 \text{ ongoing annual burden hours for all Participants} / 21 \text{ Participants}) = 686.05$ ongoing annual burden hours for each Participant to continue management of the Central Repository.

in the Notice³³¹⁰) to \$38,095.24 per Participant³³¹¹ due to the increase in the number of Participants.³³¹²

As noted above, the Participants updated the Central Repository estimates to reflect the estimates of the final three Shortlisted Bidders.³³¹³ Using the revised estimates, the Commission now estimates that the annual ongoing cost to the Participants to compensate the Plan Processor for building, operating and maintaining the Central Repository would be an aggregate ongoing external cost of \$55 million,³³¹⁴ or \$2,619,047.62 per Participant.³³¹⁵ Therefore, the Commission

³³¹⁰ See Notice, supra note 5, at Section V.D.1.a(1).

³³¹¹ The Commission is basing this external cost estimate on the public relations, legal and consulting external cost estimate provided in the CAT NMS Plan associated with the preparation of the CAT NMS Plan (which the Participants consider “reasonably associated with creating, implementing, and maintaining the CAT upon the Commission’s adoption of the CAT NMS Plan”). See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating “the Participants have incurred public relations, legal and consulting costs in preparation of the CAT NMS Plan. The Participants estimate the costs of these services to be \$8,800,000”). \$2,400,000 for all Participants over 12 months = (\$8,800,000/44 months between the adoption of Rule 613 and the filing of the CAT NMS Plan) x (12 months). Because the Central Repository will have already been created, the Commission believes it is reasonable to assume that the Participants will have a lesser need for public relations, legal and consulting services. The Commission is estimating that the Participants will incur one-third of the external cost associated with development and implementation of the Central Repository to maintain the Central Repository. \$800,000 = (0.333) x (\$2,400,000). (\$800,000 / 21 Participants) = \$38,095.24 per Participant over 12 months.

³³¹² See supra note 3282.

³³¹³ See Response Letter III at 14–15.

³³¹⁴ Id.

³³¹⁵ The Participants provided a range of Bidder estimates. See id. For purposes of this Paperwork Burden Act analysis, the Commission is using the maximum operation and maintenance cost estimate. \$2,619,047.62 = \$55,000,000 / 21 Participants. The Commission noted several uncertainties that may affect the Central Repository cost estimates, including (1) that the Participants have not yet selected a Plan Processor and the Shortlisted Bidders have submitted a wide range of cost estimates for building and operating the Central Repository; (2) the Bids submitted by the Shortlisted Bidders may

estimates that each Participant would incur ongoing annual external costs of \$2,657,142.86³³¹⁶ to maintain the Central Repository, or aggregate ongoing annual external costs across all Participants of \$55,800,000.06.³³¹⁷

b. Data Collection and Reporting

Rule 613(c)(1) requires the CAT NMS Plan to provide for an accurate, time-sequenced record of orders beginning with the receipt or origination of an order by a Participant, and further to document the life of the order through the process of routing, modification, cancellation and execution (in whole or in part) of the order. Rule 613(c) requires the CAT NMS Plan to impose requirements on Participants to record and report CAT information to the Central Repository in accordance with specified timelines.

Rule 613(c) would require the collection and reporting of some information that Participants already collect to operate their business and are required to maintain in compliance with Section 17(a) of the Exchange Act and Rule 17a-1 thereunder.³³¹⁸ For instance, the

not be final because they may be revised before the final selection of the CAT Processor; and (3) neither the Bidders nor the Commission can anticipate the evolution of technology and market activity with precision, as improvements in available technology may allow the Central Repository to be built and operated at a lower cost than is currently anticipated, but if levels of anticipated market activity are materially underestimated, the capacity of the Central Repository may need to be increased, resulting in an increase in costs.

³³¹⁶ \$2,657,142.86 for each Participant to maintain the Central Repository = (\$2,619,047.62 per Participant in ongoing annual costs to maintain the Central Repository) + (\$38,095.24 per Participant in ongoing annual public relations, legal and consulting costs associated with the maintenance of the Central Repository).

³³¹⁷ \$55,800,000.06 for all of the Participants to maintain the Central Repository = (\$2,657,142.86 per Participant to compensate the Plan Processor and for external public relations, legal and consulting costs associated with the maintenance of the Central Repository) x (21 Participants).

³³¹⁸ 15 U.S.C. 78q(a); 17 CFR 240.17a-1.

Commission believes that the national securities exchanges keep records pursuant to Section 17(a) of the Exchange Act and Rule 17a-1 thereunder in electronic form, of the receipt of all orders entered into their systems, as well as records of the routing, modification, cancellation, and execution of those orders. However, Rule 613 requires the Participants to collect and report additional and more detailed information, and to report the information to the Central Repository in a uniform electronic format, or in a manner that would allow the Central Repository to convert the data to a uniform electronic format for consolidation and storage.

For its estimates of the Participants' costs to report CAT Data, the Commission is relying on the cost data provided by the Participants in the CAT NMS Plan. The Commission believes that such reliance is appropriate because the estimates in the CAT NMS Plan are based on Participants' responses to the Participants Study undertaken to estimate CAT-related costs for hardware and software, FTE costs, and third-party providers, if the Commission approves the CAT NMS Plan.³³¹⁹ The Commission is providing below its paperwork burden estimates for the initial burden hours and external costs, and ongoing, annual burden hours and external costs to be incurred by the Participants to comply with the data reporting requirements of Rule 613.³³²⁰

³³¹⁹ Third-party provider costs are generally legal and consulting costs, but may include other outsourcing. The template used by respondents is available at <http://catnmsplan.com/PastEvents/> under the Section titled "6/23/14" at the "Cost Study Working Template" link.

³³²⁰ The Commission notes that throughout this Paperwork Reduction Act analysis, it is categorizing the FTE cost estimates for the Participants, as well as the broker-dealer respondents, that were provided in the CAT NMS Plan as an internal burden. To convert the FTE cost estimates into internal burden hours, the Commission: (1) divided the FTE cost estimates by a divisor of \$424,350, which is the Commission's estimated average salary for a full-time equivalent employee in the securities industry in a job category associated with regulatory data reporting; and then (2) multiplied the quotient by 1,800 (the number of hours a full-time equivalent employee is estimated to work per year). See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192. The

(1) Initial Burden Hours and External Cost

The CAT NMS Plan provides the following average costs that the Participants would expect to incur to adopt the systems changes needed to comply with the data reporting requirements of the CAT: \$10,300,000 in aggregate FTE costs for internal operational, technical/development, and compliance functions; \$770,000 in aggregate third party legal and consulting costs; and \$17,900,000 in aggregate total costs.³³²¹

A. Notice Estimates – Initial Burden and Costs

In the Notice, based on estimates provided in the CAT NMS Plan, the Commission preliminarily estimated that the initial internal burden hours to develop and implement the needed systems changes to capture the required information and transmit it to the Central Repository in compliance with the Rule for each Participant would be approximately 2,185

Participants represented that the cost per FTE is \$401,440. The \$401,440 figure used in the CAT NMS Plan was based on a Programmer Analyst's salary (\$193 per hour) from SIFMA's Management & Professional Earnings in the Securities Industry 2008, multiplied by 40 hours per week, then multiplied by 52 weeks per year. The Commission has updated this number to include recent salary data for other job categories associated with regulatory data reporting in the securities industry, using the hour and multiple methodology used by the Commission in its paperwork burden analyses. The Commission is using \$424,350 as its annual cost per FTE for purposes of its cost estimates. The \$424,350 FTE cost = 25% Compliance Manager + 75% Programmer Analyst (0.25) x (\$283 per hour x 1,800 working hours per year) + (0.75) x (\$220 per hour x 1,800 working hours per year). The \$283 per hour figure for a Compliance Manager and the \$220 per hour figure for a Programmer Analyst are from SIFMA's Management & Professional Earnings in the Securities Industry 2013, modified by the Commission to account for an 1,800-hour work-year and multiplied by 5.35 to account for bonuses, firm size, employee benefits and overhead.

³³²¹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2). Of the \$17,900,000 in aggregate total costs, \$11,070,000 is identified (subtotal of FTE costs and outsourcing), but the remaining \$6,830,000 is not identified in the CAT NMS Plan. The Commission believes that the \$6,830,000 may be attributed to hardware costs because the Participants have not provided any hardware costs associated with data reporting elsewhere and the Commission believes that the Participants will likely incur external costs to purchase upgraded hardware to report data to the Central Repository.

burden hours.³³²² The Commission also preliminarily estimated that each Participant would, on average, incur approximately \$38,500 in initial third party legal and consulting costs³³²³ for a total of \$380,000 in initial external costs.³³²⁴ Therefore, the Commission preliminarily estimated that, for all Participants, the estimated aggregate one-time burden would be 43,690 hours³³²⁵ and the estimated aggregate initial external cost would be \$7,600,000.³³²⁶

B. Comments/Responses on Initial Costs

One commenter believed that estimates of current data reporting costs to Participants were “grossly underestimated,”³³²⁷ and stated that the implementation cost estimate of \$17.9 million for Participants was “not too far off,” but felt the Participants’ estimated costs for legal and consulting services and additional employees were not reliable.³³²⁸

³³²² $(\$10,300,000 \text{ anticipated initial FTE costs}) / (20 \text{ SROs}) = \$515,000 \text{ in anticipated initial FTE costs per Participant. } (\$515,000 \text{ in anticipated initial FTE costs per Participant}) / (\$424,350 \text{ FTE costs per Participant}) = 1.214 \text{ anticipated FTEs per Participant for the implementation of data reporting. } (1.214 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 2,184.5 \text{ initial burden hours per Participant to implement CAT Data reporting.}$

³³²³ $(\$770,000 \text{ anticipated initial third party costs}) / (20 \text{ Participants}) = \$38,500 \text{ in initial anticipated third party costs per Participant.}$

³³²⁴ To determine the total initial external cost per Participant, the Commission subtracted the anticipated initial FTE cost estimates for the Participants as provided in the Plan from the total aggregate initial costs to the Participants and divided the remainder by 20 Participants. $(\$17,900,000 \text{ total aggregate initial cost to Participants}) - (\$10,300,000 \text{ initial FTE cost to Participants}) = \$7,600,000. (\$7,600,000) / 20 \text{ Participants} = \$380,000 \text{ in initial external costs per Participant. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(1) for the Participants’ anticipated costs associated with the implementation of regulatory reporting to the Central Repository.}$

³³²⁵ $43,690 \text{ initial burden hours} = (20 \text{ Participants}) \times (2,184.5 \text{ initial burden hours}).$

³³²⁶ $\$7,600,000 = (\$380,000 \text{ in initial external costs}) \times (20 \text{ Participants}).$

³³²⁷ Data Boiler Letter at 35.

³³²⁸ Data Boiler Letter at 35.

The Commission has considered the comment and continues to believe that the Participant cost estimates presented in the Plan are credible and is thus not changing its cost estimates of Participants' Data Recording and Reporting in response to the commenter. All 19 Participants³³²⁹ responded to the Participants Study that served as the basis of the estimates, and most Participants have experience collecting audit trail data as well as expertise in the requirements of the CAT and in their business practices. The commenter did not provide an explanation for why the Participants were unable to reasonably estimate their own current data reporting costs.

C. Order Estimates – Initial Burden and Costs

As noted earlier, subsequent to the publication of the Notice, the expected number of Participants has increased from 20 to 21.³³³⁰ As a result, the Commission is modifying its estimates of the initial burden and costs of Participants' data collection and reporting. After incorporating the increase in the number of Participants, the Commission now estimates that the initial internal burden hours to develop and implement the needed systems changes to capture the required information and transmit it to the Central Repository in compliance with the Rule for each Participant would be approximately 2,080.80 burden hours.³³³¹ The Commission also now estimates that each Participant would, on average, incur approximately \$36,666.67 in initial third

³³²⁹ There were 19 Participants at the time the Participants conducted the study.

³³³⁰ See supra note 3282.

³³³¹ $(\$10,300,000 \text{ anticipated initial FTE costs}) / (21 \text{ Participants}) = \$490,476.19$ in anticipated initial FTE costs per Participant. $(\$490,476.19 \text{ in anticipated initial FTE costs per Participant}) / (\$424,350 \text{ FTE costs per Participant}) = 1.156$ anticipated FTEs per Participant for the implementation of data reporting. $(1.156 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 2,080.8$ initial burden hours per Participant to implement CAT Data reporting.

party legal and consulting costs³³³² for a total of \$361,904.76 in initial external costs.³³³³

Therefore, the Commission now estimates that, for all Participants, the estimated aggregate one-time burden would be 43,696.80 hours³³³⁴ and the estimated aggregate initial external cost would be approximately \$7,600,000.³³³⁵

(2) Ongoing, Annual Burden Hours and External Cost

Once a Participant has established the appropriate systems and processes required for collection and transmission of the required information to the Central Repository, the Commission estimates that Rule 613 would impose on each Participant ongoing annual burdens associated with, among other things, personnel time to monitor each Participant's reporting of the required data and the maintenance of the systems to report the required data; and implementing changes to trading systems that might result in additional reports to the Central Repository. The CAT NMS Plan provides the following average aggregate costs that the Participants would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$7,300,000 in anticipated annual FTE costs for operational, technical/development,

³³³² $(\$770,000 \text{ anticipated initial third party costs}) / (21 \text{ Participants}) = \$36,666.67$ in initial anticipated third party costs per Participant.

³³³³ To determine the total initial external cost per Participant, the Commission subtracted the anticipated initial FTE cost estimates for the Participants as provided in the Plan from the total aggregate initial costs to the Participants and divided the remainder by 21 Participants. $(\$17,900,000 \text{ total aggregate initial cost to Participants}) - (\$10,300,000 \text{ initial FTE cost to Participants}) = \$7,600,000$. $(\$7,600,000) / 21 \text{ Participants} = \$361,904.76$ in initial external costs per Participant. See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii)(B)(1) for the Participants' anticipated costs associated with the implementation of regulatory reporting to the Central Repository.

³³³⁴ $43,696.80 \text{ initial burden hours} = (21 \text{ Participants}) \times (2,080.80 \text{ initial burden hours})$.

³³³⁵ $\$7,599,999.96 = (\$361,904.76 \text{ in initial external costs}) \times (21 \text{ Participants})$.

and compliance functions related to data reporting; \$720,000 in annual third party legal, consulting, and other costs;³³³⁶ and \$14,700,000 total annual costs.³³³⁷

A. Notice Estimates – Ongoing Burden and Costs

In the Notice, based on estimates provided in the CAT NMS Plan, the Commission believed that it would take each Participant 1,548 ongoing burden hours per year³³³⁸ to continue compliance with Rule 613. The Commission preliminarily estimated that it would cost, on average, approximately \$36,000 in ongoing third party legal and consulting and other costs³³³⁹ and \$370,000 in total ongoing external costs per Participant.³³⁴⁰ Therefore, the Commission preliminarily estimated that the estimated aggregate ongoing burden for all Participants would be

³³³⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2). The CAT NMS Plan did not identify the other costs.

³³³⁷ Of the \$14,700,000 in aggregate total annual costs, \$8,020,000 is identified (subtotal of FTE costs and outsourcing), but the remaining \$6,680,000 is not identified in the CAT NMS Plan. The Commission believes that this amount may be attributed to hardware costs because the Participants have not provided any hardware costs associated with data reporting elsewhere and the Commission believes that the Participants will likely incur costs to upgrade their hardware to report data to the Central Repository.

³³³⁸ $(\$7,300,000 \text{ in anticipated Participant annual FTE costs}) / (20 \text{ Participants}) = \$365,000$ in anticipated per Participant annual FTE costs. $(\$365,000 \text{ in anticipated per Participant FTE costs}) / (\$424,350 \text{ FTE cost per Participant}) = 0.86$ anticipated FTEs per Participant. $(0.86 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 1,548.3$ burden hours per Participant to maintain CAT Data reporting.

³³³⁹ $(\$720,000 \text{ in annual third party costs}) / (20 \text{ Participants}) = \$36,000$ per Participant in anticipated annual third party costs.

³³⁴⁰ To determine the total external annual cost per Participant, the Commission subtracted the anticipated annual FTE cost estimates for the Participants as provided in the Plan from the total aggregate annual costs to the Participants and divided the remainder by 20 Participants. $(\$14,700,000 \text{ total aggregate annual cost to Participants}) - (\$7,300,000 \text{ annual FTE cost to Participants}) = \$7,400,000$. $(\$7,400,000) / 20 \text{ Participants} = \$370,000$ in annual external costs per Participant. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(1) for the Participants' anticipated maintenance costs associated with regulatory reporting to the Central Repository.

approximately 30,966 hours³³⁴¹ and an estimated aggregate ongoing external cost of \$7,400,000.³³⁴²

B. Comments/Responses on Ongoing Costs

One commenter noted that the Participants' ongoing data reporting cost estimates do not include a "per-message toll charge in the CAT funding model."³³⁴³ The Commission considered this comment, but notes that the Participants are not charged for message traffic according to the Plan's funding model.

One commenter noted that the Participants' ongoing data reporting cost estimates do not include a "per-message toll charge in the CAT funding model."³³⁴⁴ The Commission considered this comment, but notes that the Participants are not charged for message traffic according to the Plan's funding model.

C. Order Estimates – Ongoing Burden and Costs

As noted earlier, subsequent to the publication of the Notice, the expected number of Participants has increased from 20 to 21.³³⁴⁵ As a result, the Commission is modifying its estimates of the ongoing burden and costs of Participants' data reporting. After incorporating the increase in the number of Participants, the Commission now estimates that it would take each Participant 1,474.20 ongoing burden hours per year³³⁴⁶ to continue compliance with Rule 613.

³³⁴¹ 30,966 annual burden hours = (20 Participants) x (1,548.3 annual burden hours).

³³⁴² \$7,400,000 = (\$370,000 in total annual external costs) x (20 Participants).

³³⁴³ Data Boiler Letter at 35.

³³⁴⁴ Data Boiler Letter at 35.

³³⁴⁵ See supra note 3282.

³³⁴⁶ $(\$7,300,000 \text{ in anticipated Participant annual FTE costs}) / (21 \text{ Participants}) = \$347,619.08 \text{ in anticipated per Participant annual FTE costs. } (\$347,619.05 \text{ in anticipated per Participant FTE costs}) / (\$424,350 \text{ FTE cost per Participant}) = 0.819 \text{ anticipated}$

The Commission now estimates that it would cost, on average, approximately \$34,285.71 in ongoing third party legal and consulting and other costs³³⁴⁷ and \$352,380.95 in total ongoing external costs per Participant.³³⁴⁸ Therefore, the Commission now estimates that the estimated aggregate ongoing burden for all Participants would be approximately 30,958.20 hours³³⁴⁹ and an estimated aggregate ongoing external cost of approximately \$7,400,000.³³⁵⁰

c. Collection and Retention of NBBO, Last Sale Data and Transaction Reports

Rule 613(e)(7) provides that the CAT NMS Plan must require the Central Repository to collect and retain on a current and continuous basis NBBO information for each NMS security, transaction reports reported pursuant to an effective transaction reporting plan, and Last Sale Reports reported pursuant to the OPRA Plan.³³⁵¹ Additionally, the CAT NMS Plan must require the Central Repository to maintain this data in a format compatible with the order and event information consolidated and stored pursuant to Rule 613(c)(7).³³⁵² Further, the CAT NMS Plan

FTEs per Participant. $(0.819 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 1,474.20$ burden hours per Participant to maintain CAT Data reporting.

³³⁴⁷ $(\$720,000 \text{ in annual third party costs}) / (21 \text{ Participants}) = \$34,285.71$ per Participant in anticipated annual third party costs.

³³⁴⁸ To determine the total external annual cost per Participant, the Commission subtracted the anticipated annual FTE cost estimates for the Participants as provided in the Plan from the total aggregate annual costs to the Participants and divided the remainder by 21 Participants. $(\$14,700,000 \text{ total aggregate annual cost to Participants}) - (\$7,300,000 \text{ annual FTE cost to Participants}) = \$7,400,000$. $(\$7,400,000) / 21 \text{ Participants} = \$352,380.95$ in annual external costs per Participant. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(1) for the Participants' anticipated maintenance costs associated with regulatory reporting to the Central Repository.

³³⁴⁹ $30,958.20 \text{ annual burden hours} = (21 \text{ Participants}) \times (1,474.20 \text{ annual burden hours})$.

³³⁵⁰ $\$7,399,999.95 = (\$352,380.95 \text{ in total annual external costs}) \times (21 \text{ Participants})$.

³³⁵¹ See 17 CFR 242.613(e)(7).

³³⁵² Id.

must require the Central Repository to retain the information collected pursuant to paragraphs (c)(7) and (e)(7) of Rule 613 for a period of not less than five years in a convenient and usable uniform electronic format that is directly available and searchable electronically without any manual intervention.³³⁵³ The Commission notes that the CAT NMS Plan includes these data as “SIP Data” to be collected by the Central Repository.³³⁵⁴ As it concluded in the Notice Paperwork Reduction Act analysis,³³⁵⁵ the Commission believes the burden associated with SIP Data is included in the burden to the Participants associated with the implementation and maintenance of the Central Repository.

d. Surveillance

Rule 613(f) provides that the CAT NMS Plan must require that every national securities exchange and national securities association develop and implement a surveillance system, or enhance existing surveillance systems, reasonably designed to make use of the consolidated information contained in the consolidated audit trail. Rule 613(a)(3)(iv) provides that the CAT NMS Plan must require that the surveillance systems be implemented within fourteen months after effectiveness of the CAT NMS Plan.

(1) Initial Burden Hours and External Cost

The CAT NMS Plan states that the estimated total cost to the Participants to implement surveillance programs within the Central Repository is \$23,200,000.³³⁵⁶ This amount includes legal, consulting, and other costs of \$560,000, as well as \$17,500,000 in FTE costs for

³³⁵³ See 17 CFR 242.613(e)(8).

³³⁵⁴ See CAT NMS Plan, supra note 5, at Section 6.5(a)(ii).

³³⁵⁵ See Notice, supra note 5, at Section V.D.1.c.

³³⁵⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2).

operational, technical/development, and compliance staff to be engaged in the creation of surveillance programs.³³⁵⁷

A. Notice Estimates – Initial Burden and Costs

In the Notice, based on the estimates provided in the CAT NMS Plan, the Commission preliminarily estimated that the initial internal burden hours to implement new or enhanced surveillance systems reasonably designed to make use of the consolidated audit trail data for each Participant would be approximately 3,711.6 burden hours,³³⁵⁸ for an aggregate initial burden hour amount of 74,232 burden hours.³³⁵⁹ The Commission also preliminarily estimated that each Participant would, on average, incur an initial external cost of approximately \$28,000³³⁶⁰ for outsourced legal, consulting and other costs in order to implement new or enhanced surveillance systems, for a total of \$285,000 in initial external costs,³³⁶¹ for an

³³⁵⁷ Id. The Commission also notes that based upon the data provided by the Participants, the source of the remaining \$5,140,000 in initial costs to implement new or enhanced surveillance systems is unspecified. The Commission believes that this amount may be attributed to hardware costs because the Participants have not provided any hardware costs associated with surveillance elsewhere and the Commission believes that the Participants will likely incur costs to implement new or enhanced surveillance systems reasonably designed to make use of the consolidated audit trail data.

³³⁵⁸ $(\$17,500,000 \text{ in anticipated initial FTE costs}) / (20 \text{ Participants}) = \$875,000 \text{ in anticipated FTE costs per Participant. } (\$875,000 \text{ in anticipated initial FTE costs per Participant}) / (\$424,350 \text{ FTE cost per Participant}) = 2.06 \text{ anticipated initial FTEs per Participant. } (2.06 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 3,711.6 \text{ initial burden hours per Participant to implement new or enhanced surveillance systems.}$

³³⁵⁹ $(3,711.6 \text{ initial burden hours per Participant to implement new or enhanced surveillance systems}) \times (20 \text{ Participants}) = 74,232 \text{ aggregate initial burden hours.}$

³³⁶⁰ $\$28,000 = \$560,000 / 20 \text{ Participants.}$

³³⁶¹ $\$285,000 = (\$23,200,000 \text{ in total initial surveillance costs} - \$17,500,000 \text{ in FTE costs}) / (20 \text{ Participants}).$

aggregate one-time initial external cost of \$5,700,000 to implement new or enhanced surveillance systems.³³⁶²

B. Comments/Responses on Initial Burden and Costs

One commenter implied that savings on surveillance were unlikely, and stated that the lack of an analytical framework did not facilitate the identification of suspicious activities.³³⁶³

Another commenter noted that uncertainties in the manner in which regulators will access data in the Central Repository create significant cost uncertainties.³³⁶⁴ On the other hand, the commenter asserted that the CAT could permit more efficient market surveillance activity by the Participants, which would allow for cost savings.³³⁶⁵

The Commission has considered these comments and continues to believe that Participant cost estimates presented in the Plan are credible. As noted above, all 19 Participants³³⁶⁶ responded to the Participants Study, and most Participants have experience collecting audit trail data as well as expertise in the requirements of CAT as well as in their business practices. Regarding the comment about the inclusion of an analytical framework in surveillance cost estimates in the Plan, the Plan does incorporate an analytical framework;³³⁶⁷ therefore, the Commission believes that Participant cost estimates already account for such a framework.

³³⁶² \$5,700,000 = \$285,000 x 20 Participants.

³³⁶³ Data Boiler Letter at 33.

³³⁶⁴ SIFMA Letter at 33.

³³⁶⁵ SIFMA Letter at 18.

³³⁶⁶ There were 19 Participants at the time the Participants conducted the study.

³³⁶⁷ See Section V.E.2.c(1), supra.

C. Order Estimates – Initial Burden and Costs

As noted earlier, subsequent to the publication of the CAT NMS Plan Notice, the expected number of Participants has increased from 20 to 21.³³⁶⁸ As a result, the Commission is modifying its estimates of the initial burden and costs to implement new or enhanced surveillance systems reasonably designed to make use of the consolidated audit trail data. After incorporating the increase in the number of Participants, the Commission now estimates that the initial internal burden hours to implement new or enhanced surveillance systems for each Participant would be approximately 3,535.20 burden hours,³³⁶⁹ for an aggregate initial burden hour amount of 74,239.20 burden hours.³³⁷⁰ The Commission also now estimates that each Participant would, on average, incur an initial external cost of approximately \$26,666.67³³⁷¹ for outsourced legal, consulting and other costs in order to implement new or enhanced surveillance systems, for a total of \$271,428.57 in initial external costs,³³⁷² for an aggregate one-time initial external cost of approximately \$5,700,000 to implement new or enhanced surveillance systems.³³⁷³

³³⁶⁸ See supra note 3282.

³³⁶⁹ $(\$17,500,000 \text{ in anticipated initial FTE costs}) / (21 \text{ Participants}) = \$833,333.33$ in anticipated FTE costs per Participant. $(\$833,333.33 \text{ in anticipated initial FTE costs per Participant}) / (\$424,350 \text{ FTE cost per Participant}) = 1.964$ anticipated initial FTEs per Participant. $(1.964 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 3,535.20$ initial burden hours per Participant to implement new or enhanced surveillance systems.

³³⁷⁰ $(3,535.20 \text{ initial burden hours per Participant to implement new or enhanced surveillance systems}) \times (21 \text{ Participants}) = 74,239.20$ aggregate initial burden hours.

³³⁷¹ $\$26,666.67 = \$560,000 / 21 \text{ Participants}$.

³³⁷² $\$271,428.57 = (\$23,200,000 \text{ in total initial surveillance costs} - \$17,500,000 \text{ in FTE costs}) / (21 \text{ Participants})$.

³³⁷³ $\$5,699,999.97 = (\$271,428.57 \text{ in initial external costs}) \times (21 \text{ Participants})$.

(2) Ongoing, Annual Burden Hours and External Cost

The CAT NMS Plan states that the estimated total annual cost associated with the maintenance of surveillance programs for the Participants is \$87,700,000.³³⁷⁴ This amount includes annual legal, consulting, and other costs of \$1,000,000, as well as \$66,700,000 in annual FTE costs for internal operational, technical/development, and compliance staff to be engaged in the maintenance of surveillance programs.³³⁷⁵

A. Notice Estimates – Ongoing Burden and Costs

In the Notice, based on the estimates provided in the CAT NMS Plan,³³⁷⁶ the Commission preliminarily estimated that the ongoing internal burden hours to maintain the new or enhanced surveillance systems reasonably designed to make use of the consolidated audit trail data for each Participant would be approximately 14,146 annual burden hours,³³⁷⁷ for an aggregate annual burden hour amount of 282,920 burden hours.³³⁷⁸ The Commission also preliminarily estimated that each Participant would, on average, incur an annual external cost of

³³⁷⁴ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2).

³³⁷⁵ Id. The Commission also notes that based upon the data provided by the Participants, the source of the remaining \$21,000,000 in ongoing costs to maintain the new or enhanced surveillance systems is unspecified. The Commission believes that this amount may be attributed to hardware costs because the Participants have not provided any hardware costs associated with surveillance elsewhere and the Commission believes that the Participants would likely incur costs associated with maintaining the new or enhanced surveillance systems.

³³⁷⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(B)(2).

³³⁷⁷ $(\$66,700,000 \text{ in anticipated ongoing FTE costs}) / (20 \text{ Participants}) = \$3,335,000$ in anticipated ongoing FTE costs per Participant. $(\$3,335,000 \text{ in anticipated ongoing FTE costs per Participant}) / (\$424,350 \text{ FTE cost per Participant}) = 7.86$ anticipated FTEs per Participant. $(7.86 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 14,146$ ongoing burden hours per Participant to maintain the new or enhanced surveillance systems.

³³⁷⁸ $(14,146 \text{ annual burden hours per Participant to maintain new or enhanced surveillance systems}) \times (20 \text{ Participants}) = 282,920$ aggregate annual burden hours.

approximately \$50,000³³⁷⁹ for outsourced legal, consulting and other costs in order to maintain the new or enhanced surveillance systems, for a total estimated ongoing external cost of \$1,050,000,³³⁸⁰ for an estimated aggregate ongoing external cost of \$21,000,000 to maintain the surveillance systems.³³⁸¹

B. Order Estimates – Ongoing Burden and Costs

As noted earlier, subsequent to the publication of the Notice, the expected number of Participants has increased from 20 to 21.³³⁸² As a result, the Commission is modifying its estimates of the ongoing burden and costs to maintain the new or enhanced surveillance systems reasonably designed to make use of the consolidated audit trail data. After incorporating the increase in the number of Participants, the Commission now estimates that the ongoing internal burden hours for each Participant would be approximately 13,473 annual burden hours,³³⁸³ for an aggregate annual burden hour amount of 282,933 burden hours.³³⁸⁴ The Commission also now estimates that each Participant would, on average, incur an annual external cost of approximately

³³⁷⁹ \$50,000 = \$1,000,000 for ongoing legal, consulting and other costs associated with maintenance of surveillance programs / 20 Participants.

³³⁸⁰ \$1,050,000 = (\$87,700,000 in total ongoing surveillance costs - \$66,700,000 in ongoing FTE costs) / 20 Participants

³³⁸¹ \$21,000,000 = \$1,050,000 x 20 Participants.

³³⁸² See supra note 3282.

³³⁸³ (\$66,700,000 in anticipated ongoing FTE costs) / (21 Participants) = \$3,176,190.48 in anticipated ongoing FTE costs per Participant. (\$3,176,190.48 in anticipated ongoing FTE costs per Participant) / (\$424,350 FTE cost per Participant) = 7.485 anticipated FTEs per Participant. (7.485 FTEs) x (1,800 working hours per year) = 13,473 ongoing burden hours per Participant to maintain the new or enhanced surveillance systems.

³³⁸⁴ (13,473 annual burden hours per Participant to maintain new or enhanced surveillance systems) x (21 Participants) = 282,933 aggregate annual burden hours.

\$47,619.05³³⁸⁵ for outsourced legal, consulting and other costs in order to maintain the new or enhanced surveillance systems, for a total estimated ongoing external cost of \$1,000,000,³³⁸⁶ for an estimated aggregate ongoing external cost of \$21,000,000 across the 21 Participants to maintain the surveillance systems.³³⁸⁷

e. Document on Expansion to Other Securities

Rule 613(i) provides that the CAT NMS Plan must require the Participants to jointly provide to the Commission, within six months after the CAT NMS Plan is effective, a document outlining how the Participants could incorporate into the CAT information regarding: (1) equity securities that are not NMS securities;³³⁸⁸ (2) debt securities; and (3) primary market transactions in equity securities that are not NMS securities and debt securities.³³⁸⁹ The document must also detail the order and Reportable Event data that each market participant may be required to provide, which market participants may be required to provide such data, an implementation timeline, and a cost estimate. Thus, the Participants must, among other things, undertake an analysis of technological and computer system acquisitions and upgrades that would be required to achieve such an expansion.

³³⁸⁵ \$47,619.05 = (\$1,000,000 for ongoing legal, consulting and other costs associated with maintenance of surveillance programs) / (21 Participants).

³³⁸⁶ \$1,000,000 = (\$87,700,000 in total ongoing surveillance costs - \$66,700,000 in ongoing FTE costs) / (21 Participants).

³³⁸⁷ \$21,000,000 = (\$1,000,000) x (21 Participants).

³³⁸⁸ As noted above, the CAT NMS Plan would require the inclusion of OTC Equity Securities, while Rule 613 does not include such a requirement. See supra note 439.

³³⁸⁹ See 17 CFR 242.613(i).

A. Notice Estimates – Initial Burden and Costs

In the Notice, the Commission preliminarily estimated that it would take each Participant approximately 180 burden hours of internal legal, compliance, business operations and information technology staff time to create a document addressing expansion of the consolidated audit trail to additional securities as required by Rule 613(i).³³⁹⁰ The Commission preliminarily estimated that on average, each Participant would outsource 25 hours of external legal time to create the document, for an aggregate one-time external cost of approximately \$10,000.³³⁹¹ Therefore, the Commission preliminarily estimated that the one-time initial burden of drafting the document required by Rule 613 would be 180 initial burden hours plus \$10,000 in initial

³³⁹⁰ The Commission based this estimate on the internal burden provided in the CAT NMS Plan related to the development of the CAT NMS Plan. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating “[t]he Participants estimate that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process”). Because this document is much more limited in scope than the CAT NMS Plan, and because the Commission assumes that in drafting the CAT NMS Plan, the Participants have already contributed time toward considering how the CAT can be expected to be expanded in accordance with Rule 613(i), the Commission applied the CAT NMS Plan development internal burden over a 6-month period (Rule 613(i) requires this document to be submitted to the Commission within six months after effectiveness of the CAT NMS Plan), divided by half. $0.667 \text{ FTEs required for all Participants per month to develop the CAT NMS Plan} = (20 \text{ FTEs} / 30 \text{ months})$. $0.667 \text{ FTEs} \times 6 \text{ months} = 4 \text{ FTEs}$. $4 \text{ FTEs} / 2 = 2 \text{ FTEs}$ needed for all of the Participants to create and submit the document. $2 \text{ FTEs} \times 1,800 \text{ working hours per year} = 3,600 \text{ burden hours}$. $3,600 \text{ burden hours} / 20 \text{ Participants} = 180 \text{ burden hours per Participant to create and file the document}$.

³³⁹¹ $\$10,000 = (25 \text{ hours of outsourced legal time per Participant}) \times (\$400 \text{ per hour rate for outside legal services})$. The Commission derived the total estimated cost for outsourced legal counsel based on the assumption that the report required by Rule 613 would require approximately fifteen percent of the Commission’s approximated burden of drafting and filing the CAT NMS Plan. This assumption is based on the Participants leveraging their knowledge gained from their drafting and filing of the CAT NMS Plan and applying it to efficiently preparing the report required by Rule 613 with respect to other securities’ order and Reportable Events, implementation timeline and cost estimates.

external costs for outsourced legal counsel per Participant, for an estimated aggregate initial burden of 3,600 hours and an estimated aggregate initial external cost of \$200,000.³³⁹²

B. Order Estimates – Initial Burden and Costs

As noted earlier, subsequent to the publication of the Notice, the expected number of Participants has increased from 20 to 21.³³⁹³ As a result, the Commission is modifying its estimates of the initial burden and costs of the document on expansion to additional securities. After incorporating the increase in the number of Participants, the Commission now estimates that it would take each Participant approximately 171.43 burden hours of internal legal, compliance, business operations and information technology staff time to create a document addressing expansion of the CAT to additional securities as required by Rule 613(i).³³⁹⁴ The Commission now estimates that on average, each Participant would outsource 25 hours of

³³⁹² The initial burden hour estimate is based on: (20 Participants) x (180 initial burden hours to draft the report). The initial external cost estimate is based on: (20 Participants) x (\$10,000 for outsourced legal counsel).

³³⁹³ See supra note 3282.

³³⁹⁴ The Commission is basing this estimate on the internal burden provided in the CAT NMS Plan related to the development of the CAT NMS Plan. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii) (stating “[t]he Participants estimate that they have collectively contributed 20 FTEs in the first 30 months of the CAT NMS Plan development process”). Because the expansion document is much more limited in scope than the CAT NMS Plan, and because the Commission assumes that in drafting the CAT NMS Plan, the Participants have already contributed time toward considering how the CAT can be expected to be expanded in accordance with Rule 613(i), the Commission is applying the CAT NMS Plan development internal burden over a 6-month period (Rule 613(i) requires this document to be submitted to the Commission within six months after effectiveness of the CAT NMS Plan), divided by half. $0.667 \text{ FTEs required for all Participants per month to develop the CAT NMS Plan} = (20 \text{ FTEs} / 30 \text{ months})$. $0.667 \text{ FTEs} \times 6 \text{ months} = 4 \text{ FTEs}$. $4 \text{ FTEs} / 2 = 2 \text{ FTEs}$ needed for all of the Participants to create and submit the document. $2 \text{ FTEs} \times 1,800 \text{ working hours per year} = 3,600 \text{ burden hours}$. $(3,600 \text{ burden hours}) / (21 \text{ Participants}) = 171.43 \text{ burden hours per Participant to create and file the document}$.

external legal time to create the document, for an aggregate one-time external cost of approximately \$10,000.³³⁹⁵ Therefore, the Commission now estimates that the one-time initial burden of drafting the document required by Rule 613 would be 171.43 initial burden hours plus \$10,000 in initial external costs for outsourced legal counsel per Participant, for an estimated aggregate initial burden of 3,600.3 hours and an estimated aggregate initial external cost of \$210,000.³³⁹⁶

f. Written Assessment of Operation of the Consolidated Audit Trail

Rule 613(b)(6) provides that the CAT NMS Plan must require the Participants to provide the Commission a written assessment of the CAT's operation at least every two years, once the CAT NMS Plan is effective.³³⁹⁷ The assessment must address, at a minimum, with respect to the CAT: (i) an evaluation of its performance; (ii) a detailed plan for any potential improvements to its performance; (iii) an estimate of the costs associated with any such potential improvements; and (iv) an estimated implementation timeline for any such potential improvements, if

³³⁹⁵ \$10,000 = (25 hours of outsourced legal time per Participant) x (\$400 per hour rate for outside legal services). The Commission derived the total estimated cost for outsourced legal counsel based on the assumption that the report required by Rule 613 would require approximately fifteen percent of the Commission's approximated burden of drafting and filing the CAT NMS Plan. This assumption is based on the Participants leveraging their knowledge gained from their drafting and filing of the CAT NMS Plan and applying it to efficiently preparing the report required by Rule 613 with respect to other securities' order and Reportable Events, implementation timeline and cost estimates.

³³⁹⁶ The initial burden hour estimate is based on: (21 Participants) x (171.43 initial burden hours to draft the report). The initial external cost estimate is based on: (21 Participants) x (\$10,000 for outsourced legal counsel).

³³⁹⁷ 17 CFR 242.613(b)(6); see also Notice, supra note 5, at 30700.

applicable.³³⁹⁸ Thus, the Participants must, among other things, undertake an analysis of the CAT's technological and computer system performance.

The CAT NMS Plan states that the CCO would oversee the assessment required by Rule 613(b)(6), and would allow the Participants to review and comment on the assessment before it is submitted to the Commission.³³⁹⁹ The CCO would be an employee of the Plan Processor and would be compensated by the Plan Processor.³⁴⁰⁰ The Commission assumes that the overall cost and associated burden on the Participants to implement and maintain the Central Repository includes both the compensation for the Plan Processor as well as its employees for the implementation and maintenance of the Central Repository.

A. Notice Estimates – Ongoing Burden and Costs

In the Notice, the Commission preliminarily estimated that it would take each Participant approximately 45 annual burden hours of internal legal, compliance, business operations, and information technology staff time to review and comment on the assessment prepared by the CCO of the operation of the consolidated audit trail as required by Rule 613(b)(6).³⁴⁰¹ The

³³⁹⁸ See 17 CFR 242.613(b)(6).

³³⁹⁹ See CAT NMS Plan, supra note 5, at Section 6.6.

³⁴⁰⁰ Id. at Section 6.2(a).

³⁴⁰¹ The Commission calculated the total estimated burden hours based on a similar formulation used for calculating the total estimated burden hours of Rule 613(i)'s requirement for a document addressing expansion of the CAT to other securities. See Notice, supra note 5, at Section V.D.1.f. The Commission assumed that the review and potential revision of the written assessment required by Rule 613(b)(6) would be approximately one-half as burdensome as the document required by Rule 613(i) as the Participants are delegating the responsibility to prepare the written assessment required by Rule 613(b)(6) to the CCO and the Participants would only need to review the written assessment and revise it as necessary. As noted in note 3394, supra, to estimate the Rule 613(i) burden, the Commission is applying the internal burden estimate provided in the CAT NMS Plan for Plan development over a 6-month period, and dividing the result in

Commission preliminarily estimated that on average, each Participant would outsource 1.25 hours of legal time annually to assist in the review of the assessment, for an ongoing annual external cost of approximately \$500.³⁴⁰² Therefore, the Commission preliminarily estimated that the ongoing annual burden of submitting a written assessment at least every two years, as required by Rule 613(b)(6), would be 45 ongoing burden hours per SRO plus \$500 of external costs for outsourced legal counsel per Participant per year, for an estimated aggregate annual ongoing burden of 900 hours³⁴⁰³ and an estimated aggregate ongoing external cost of \$10,000.³⁴⁰⁴

half. See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii). To estimate the Rule 613(b)(6) written assessment burden, the Commission is dividing the result further by half. 0.667 FTEs required for all Participants per month to develop the CAT NMS Plan = (20 FTEs / 30 months). 0.667 FTEs x 6 months = 4 FTEs. 4 FTEs / 2 = 2 FTEs needed for all of the Participants to create and submit the Rule 613(i) document. 2 FTEs / 2 = 1 FTE needed for all of the Participants to review and comment on the written assessment. (1 FTE x 1,800 working hours per year) = 1,800 ongoing annual burden hours per year for all of the Participants to review and comment on the written assessment. (1,800 burden hours / 20 Participants) = 90 ongoing annual burden hours per Participant to review and comment on the written assessment prepared by the CCO. The Commission noted that this assessment must be filed with the Commission every two years and is providing an annualized estimate of the burden associated with the assessment as required for its Paperwork Reduction Act analysis. To provide an estimate of the annual burden associated with the assessment as required for its Paperwork Reduction Act analysis, Commission divided the 90 ongoing burden hours in half (over two years) = 45 ongoing annual burden hours per Participant to review and comment on the written assessment prepared by the CCO.

³⁴⁰² \$500 = (\$400 per hour rate for outside legal services) x (1.25 hours). Because the written assessment was a biennial requirement, the Commission divided the cost of the written assessment in half (over two years) to estimate the annual ongoing external cost per Participant for outside legal services to review and comment on the written assessment prepared by the CCO.

³⁴⁰³ 900 ongoing annual burden hours = (45 ongoing annual burden hours) x (20 Participants).

³⁴⁰⁴ \$10,000 = 20 Participants x (\$400 per hour rate for outside legal services) x (1.25 hours).

B. Order Estimates – Ongoing Burden and Costs

As noted above,³⁴⁰⁵ the Commission has subsequently amended this requirement as imposed by the CAT NMS Plan to change the reporting frequency from every two years to annual, to require that the benefits of potential improvements, and their impact on investor protection, be discussed, as well as to provide additional specificity regarding the content of the report.³⁴⁰⁶ As amended, the content of the report must include the following: (i) an evaluation of the information security program of the CAT to ensure that the program is consistent with the highest industry standards for protection of data; (ii) an evaluation of potential technological upgrades based upon a review of technological advancements over the preceding year, drawing on technological expertise, whether internal or external; (iii) an evaluation of the time necessary to restore and recover CAT Data at a back-up site; (iv) an evaluation of how the Plan Processor and Participants are monitoring Error Rates and addressing the application of Error Rates based on product, data element or other criteria; (v) a copy of the evaluation required by the CAT NMS Plan in Section 6.8(c) that the Plan Processor evaluate whether industry standards have evolved such that: (1) the synchronization standard in Section 6.8(a) of the CAT NMS Plan should be shortened; or (2) the required timestamp in Section 6.8(b) of the CAT NMS Plan should be in finer increments.

The CAT NMS Plan states that the CCO would oversee the assessment required by Rule 613(b)(6), and would allow the Participants to review and comment on the assessment before it is submitted to the Commission.³⁴⁰⁷ The Commission believes the responsibility to oversee the

³⁴⁰⁵ See Section VI.A.7., supra.

³⁴⁰⁶ See Section IV.H., supra.

³⁴⁰⁷ See CAT NMS Plan, supra note 5, at Section 6.6.

assessment as amended should continue to belong to the CCO and is not amending the CAT NMS Plan to require a different process.

As a result, the Commission is modifying its estimates of the ongoing burden and costs related to the written assessment of the operation of the CAT, as well as to account for an increase in the expected number of Participants from 20 to 21, subsequent to the publication of the Notice.³⁴⁰⁸ The Commission now estimates that it would take each Participant approximately 171.43 annual burden hours of internal legal, compliance, business operations, and information technology staff time to review and comment on the assessment prepared by the CCO of the operation of the CAT.³⁴⁰⁹ The Commission now estimates that on average, each Participant

³⁴⁰⁸ See supra note 3282.

³⁴⁰⁹ As it did when making its preliminary estimate, the Commission calculated the total estimated burden hours based on a similar formulation used for calculating the total estimated burden hours of Rule 613(i)'s requirement for a document addressing expansion of the CAT to other securities. See Section VI.D.1.e., supra. Specifically, as noted above, the Commission assumed that the review and potential revision of the written assessment would be approximately one-half as burdensome as the document required by Rule 613(i) when making its preliminary estimate. The Commission then further divided the burden by half because this report is required to be furnished every two years.

The Commission has amended the CAT NMS Plan to add more specificity to the requirement to provide the written assessment. As a result, the Commission now estimates that the written assessment would now be as burdensome (instead of half as burdensome) as the document addressing expansion required by Rule 613(i). 2 FTEs needed for all of the Participants to create and submit the document required by Rule 613(i) (and now for all of the Participants to review and comment on the written assessment). $(2 \text{ FTEs}) \times (1,800 \text{ working hours per year}) = 3,600$ ongoing annual burden hours per year for all of the Participants to review and comment on the written assessment. $(3,600 \text{ burden hours per year}) / (21 \text{ Participants}) = 171.43$ ongoing annual burden hours per Participant to review and comment on the written assessment prepared by the CCO.

The Commission also has amended the CAT NMS Plan to require this assessment to be provided annually instead of once every two years. To account for this change, the

would outsource 2.5 hours of legal time annually to assist in the review of the assessment, for an ongoing annual external cost of approximately \$1,000.³⁴¹⁰ Therefore, the Commission now estimates that the ongoing annual burden of submitting a written assessment annually would be 171.43 ongoing burden hours per SRO plus \$1,000 of external costs for outsourced legal counsel per Participant per year, for an estimated aggregate annual ongoing burden of approximately 3,600.03 hours³⁴¹¹ and an estimated aggregate ongoing external cost of \$21,000.³⁴¹²

2. Burden on Members of National Securities Exchanges and National Securities Associations

a. Data Collection and Reporting

Rule 613(c)(1) requires the CAT NMS Plan to provide for an accurate, time-sequenced record of orders beginning with the receipt or origination of an order by a broker-dealer member of a Participant, and further documenting the life of the order through the process of routing, modification, cancellation and execution (in whole or in part) of the order. Rule 613(c) requires the CAT NMS Plan to impose requirements on broker-dealer members to record and report CAT Data to the Central Repository in accordance with specified timelines.

Commission is no longer dividing the ongoing burden hours for providing the written assessment in half to determine the annualized estimate of the burden.

³⁴¹⁰ \$1,000 = (\$400 per hour rate for outside legal services) x (2.5 hours). The Commission has amended the CAT NMS Plan to add more specificity to the requirement to provide the written assessment and is now requiring this assessment to be provided annually instead of once every two years. Because the written assessment is no longer a biennial requirement, the Commission is no longer dividing the cost of the written assessment in half (over two years) to estimate the annual ongoing external cost per Participant for outside legal services to review and comment on the written assessment prepared by the CCO.

³⁴¹¹ 3,600.03 ongoing annual burden hours = (171.43 ongoing annual burden hours) x (21 Participants).

³⁴¹² \$21,000 = (21 Participants) x (\$400 per hour rate for outside legal services) x (2.5 hours).

In calculating the burden on members of national securities exchanges and national securities associations, the Commission categorized broker-dealer firms by whether they insource or outsource, or are likely to insource or outsource, CAT Data reporting obligations.³⁴¹³ The Commission believes that firms that currently report high numbers of OATS ROEs strategically would decide to either self-report their CAT Data or outsource their CAT Data reporting functions (Insourcers), while the firms with the lowest levels of activity would be unlikely to have the infrastructure and specialized employees necessary to insource CAT Data reporting and would almost certainly outsource their CAT Data reporting functions (Outsourcers).³⁴¹⁴ The Commission recognizes that more active firms that will likely be CAT Reporters and insource regulatory data reporting functions may not have current OATS reporting obligations because they either are not FINRA members, or because they do not trade in NMS equity securities.³⁴¹⁵

The Commission estimates that there are 126 OATS-reporting Insourcers and 45 non-OATS reporting Insourcers (14 ELPs and 31 Options Market Makers).³⁴¹⁶ The Commission's

³⁴¹³ The Commission acknowledges the inherent difficulty in establishing precise burden estimates because the Commission does not know the exact method of data reporting the Participants would decide for broker-dealers. For these estimates, the Commission is relying, in part, on the cost data provided by the Participants in the CAT NMS Plan, and, as noted earlier, on its own estimates of the costs that broker-dealers are likely to face for CAT implementation and ongoing reporting in compliance with Rule 613. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b); see Section V.F.1.c.(2)B., supra.

³⁴¹⁴ See Notice, supra note 5, at 30718.

³⁴¹⁵ The Commission also recognizes as discussed above that some broker-dealer firms may strategically choose to outsource despite the Plan's working assumption that these broker-dealers would insource their regulatory data reporting functions.

³⁴¹⁶ See Section V.F.1.c(2)B., supra.

estimation categorizes the remaining 1,629 broker-dealers that the Plan anticipates would have CAT Data reporting obligations as Outsourcers.³⁴¹⁷

(1) Notice Estimates

A. Insourcers

i. Large Non-OATS-Reporting Broker-Dealers

In the CAT NMS Plan, the Participants, based on the Reporters Study's large broker-dealer cost estimates, estimated the following average initial external cost and FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to adopt the systems changes needed to comply with the data reporting requirements of Rule 613 under Approach 1: \$450,000 in external hardware and software costs; 8.05 internal FTEs,³⁴¹⁸ and \$9,500 in external third party/outsourcing costs.³⁴¹⁹ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$80,000 in external hardware and software costs; 7.41 internal FTEs,³⁴²⁰ and \$1,300 in external third party/outsourcing costs.³⁴²¹

³⁴¹⁷ Id.

³⁴¹⁸ Approach 1 also provided \$3,200,000 in initial internal FTE costs. The Commission believed the \$3,200,000 in internal FTE costs is the Participants' estimated cost of the 8.05 FTEs. (8.05 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$3,231,592. See CAT NMS Plan, supra note 5, at n. 192. See also supra note 3320.

³⁴¹⁹ See CAT NMS Plan, supra note 5, at Section B.7(b)(iii)(c)(2)(a). The Commission believed that the third party/outsourcing costs may be attributed to the use of service bureaus (potentially), technology consulting, and legal services.

³⁴²⁰ Approach 1 also provided \$3,000,000 in internal FTE costs related to maintenance. The Commission believes the \$3,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 7.41 FTEs. (7.41 FTEs) x (\$401,440 Participants' assumed annual

In the Notice, the Commission discussed the Participants' estimates and explained that the Commission also relied on the Reporters Study's large broker-dealer cost estimates in estimating costs for large broker-dealers that can practicably decide between insourcing or outsourcing their regulatory data reporting functions. In the Notice, the Commission preliminarily estimated that there are 14 large broker-dealers that are not OATS reporters currently in the business of electronic liquidity provision that would be classified as Insourcers.³⁴²² Additionally, the Commission estimated that there are 31 broker-dealers that may transact in options but not in equities that can be classified as Insourcers.³⁴²³ The Commission assumed the 31 Options Market Makers and 14 ELPs would be typical of the Reporters Study's large, non-OATS reporting firms; for these firms, the Commission relied on the cost estimates provided under Approach 1³⁴²⁴ for large, non-OATS reporting firms in the CAT NMS Plan.

cost per FTE provided in the CAT NMS Plan) = \$2,974,670. See CAT NMS Plan, supra note 5, at n.192.

³⁴²¹ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not break down these third party costs into categories.

³⁴²² These broker-dealers are not FINRA members and thus have no regular OATS reporting obligations. See supra note 2560.

³⁴²³ See supra note 2562.

³⁴²⁴ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(A)(2). The Reporters Study requested broker-dealer respondents to provide estimates to report to the Central Repository under two approaches. Approach 1 assumes CAT Reporters would submit CAT Data using their choice of industry protocols. Approach 2 assumes CAT Reporters would submit data using a pre-specified format. Approach 1's aggregate costs are higher than those for Approach 2 for all market participants except in one case where service bureaus have lower Approach 1 costs. See supra note 2568. For purposes of this Paperwork Reduction Act analysis, the Commission did not rely on the cost estimates for Approach 2 because overall the Approach 1 aggregate estimates represent the higher of the proposed approaches. The Commission believed it would be more comprehensive to use the higher of the two estimates for its Paperwork Reduction Act analysis estimates.

The Notice explained that once a large non-OATS reporting broker-dealer has established the appropriate systems and processes required for collection and transmission of the required information to the Central Repository, such broker-dealers would be subject to ongoing annual burdens associated with, among other things, personnel time to monitor each large non-OATS reporting broker-dealer's reporting of the required data and the maintenance of the systems to report the required data; and implementing changes to trading systems that might result in additional reports to the Central Repository.

(a) Large, Non-OATS Reporting Broker-Dealers – Initial Burden and Costs

In the Notice, the Commission preliminarily estimated that the average initial burden associated with implementing regulatory data reporting to capture the required information and transmit it to the Central Repository in compliance with the Rule for each large, non-OATS reporting broker-dealer would be approximately 14,490 initial burden hours.³⁴²⁵

The Commission also preliminarily estimated that these broker-dealers would, on average, would incur approximately \$450,000 in initial costs for hardware and software to implement the systems changes needed to capture the required information and transmit it to the Central Repository, and an additional \$9,500 in initial third party/outsourcing costs.³⁴²⁶

Therefore, the Commission preliminarily estimated that the average one-time initial burden per ELP and Options Market Maker would be 14,490 internal burden hours and external

³⁴²⁵ 14,490 initial burden hours = (8.05 FTEs for implementing CAT Data reporting systems) x (1,800 working hours per year).

³⁴²⁶ See supra note 3421.

costs of \$459,500,³⁴²⁷ for an estimated aggregate initial burden of 652,050 hours³⁴²⁸ and an estimated aggregate initial external cost of \$20,677,500.³⁴²⁹

(b) Large, Non-OATS Reporting Broker-Dealers – Ongoing Burden and Costs

In the Notice, the Commission preliminarily estimated that it would take a large non-OATS reporting broker-dealer 13,338 burden hours per year³⁴³⁰ to continue to comply with the Rule. The Commission also preliminarily estimated that it would cost, on average, approximately \$80,000 per year per large non-OATS reporting broker-dealer to maintain systems connectivity to the Central Repository and purchase any necessary hardware, software, and other materials, and an additional \$1,300 in third party/outsourcing costs.³⁴³¹

Therefore, the Commission preliminarily estimated that the average ongoing annual burden per large non-OATS reporting broker-dealer would be approximately 13,338 hours, plus \$81,300 in external costs³⁴³² to maintain the systems necessary to collect and transmit

³⁴²⁷ (\$450,000 in initial hardware and software costs) + (\$9,500 initial third party/outsourcing costs) = \$459,500 in initial external costs to implement data reporting systems.

³⁴²⁸ The Commission preliminarily estimates that 45 large non-OATS reporting broker-dealers would be impacted by this information collection. (45 large non-OATS reporting broker-dealers) x (14,490 burden hours) = 652,050 initial burden hours to implement data reporting systems.

³⁴²⁹ (\$450,000 in hardware and software costs) + (\$9,500 third party/outsourcing costs) x 45 large, non-OATS reporting broker-dealers = \$20,677,500 in initial external costs to implement data reporting systems.

³⁴³⁰ 13,338 ongoing burden hours = (7.41 ongoing FTEs to maintain CAT data reporting systems) x (1,800 working hours per year).

³⁴³¹ See supra note 3421.

³⁴³² (\$80,000 in ongoing external hardware and software costs) + (\$1,300 ongoing external third party/outsourcing costs) = \$81,300 in ongoing external costs per large non-OATS reporting broker-dealer.

information to the Central Repository, for an estimated aggregate ongoing burden of 600,210 hours³⁴³³ and an estimated aggregate ongoing external cost of \$3,658,500.³⁴³⁴

ii. Large OATS-Reporting Broker-Dealers

In the CAT NMS Plan, the Participants, based on the Reporters Study's large broker-dealer cost estimates, estimated the following average initial external cost and internal FTE count figures that a large OATS-reporting broker-dealer would expect to incur as a result of the implementation of the consolidated audit trail under Approach 1: \$750,000 in hardware and software costs; 14.92 internal FTEs;³⁴³⁵ and \$150,000 in external third party/outsourcing costs.³⁴³⁶ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large OATS-reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$380,000 in ongoing

³⁴³³ The Commission estimated that 45 large non-OATS reporting broker-dealers would be impacted by this information collection. (45 large non-OATS reporting broker-dealers) x (13,338 burden hours) = 600,210 aggregate ongoing burden hours.

³⁴³⁴ (\$80,000 in ongoing external hardware and software costs) + (\$1,300 ongoing external third party/outsourcing costs) x (45 large non-OATS reporting broker-dealers) = \$3,658,500 in aggregate ongoing external costs.

³⁴³⁵ Approach 1 also provided \$6,000,000 in initial internal FTE costs. The Commission believes the \$6,000,000 in initial internal FTE costs is the Participants' estimated cost of the 14.92 FTEs. (14.92 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$5,989,485. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192; see also supra note 3320.

³⁴³⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(a). The CAT NMS Plan did not break down these third party costs into categories. The Commission believes that these costs may be attributed to the use of service bureaus, technology consulting, and legal services.

external hardware and software costs; 10.03 internal FTEs;³⁴³⁷ and \$120,000 in ongoing external third party/outsourcing costs.³⁴³⁸

In the Notice, the Commission discussed the Participants' estimates and explained that the Commission also relied on the Reporters Study's large broker-dealer cost estimates in estimating costs for large broker-dealers that can practicably decide between insourcing or outsourcing their regulatory reporting functions. In the Notice, based on the Commission's analysis of data provided by FINRA and discussions with market participants, the Commission estimated that 126 broker-dealers, which reported more than 350,000 OATS ROEs between June 15 and July 10, 2015, would strategically decide to either self-report CAT Data or outsource their CAT data reporting functions.³⁴³⁹

The Notice explained that once a large OATS-reporting broker-dealer has established the appropriate systems and processes required for collection and transmission of the required information to the Central Repository, such broker-dealers would be subject to ongoing annual burdens and costs associated with, among other things, personnel time to monitor each broker-dealer's reporting of the required data and the maintenance of the systems to report the required

³⁴³⁷ Approach 1 also provided \$4,000,000 in internal FTE costs related to maintenance. The Commission believes the \$4,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 10.03 FTEs. (10.03 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$4,026,443. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192; see also supra note 3320.

³⁴³⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not categorize these third party costs. The Commission believes that these costs may be attributed to the use of service bureaus, technology consulting, and legal services.

³⁴³⁹ See Notice, supra note 5, at 30718; see also id., at n.901 (stating that the Commission believes that broker-dealers that report fewer than 350,000 OATS ROEs per month are unlikely to be large enough to support the infrastructure required for insourcing data reporting activities).

data; and implementing changes to trading systems which might result in additional reports to the Central Repository.

(a) Large OATS-Reporting Broker-Dealers – Initial Burden and Costs

In the Notice, the Commission preliminarily estimated that the average initial burden to develop and implement the needed systems changes to capture the required information and transmit it to the Central Repository in compliance with the Rule for large OATS-reporting broker-dealers would be approximately 26,856 internal burden hours.³⁴⁴⁰

The Commission also preliminarily estimated that these large OATS-reporting broker-dealers would, on average, incur approximately \$750,000 in initial external costs for hardware and software to implement the systems changes needed to capture the required information and transmit it to the Central Repository, and an additional \$150,000 in initial external third party/outsourcing costs.³⁴⁴¹

Therefore, the Commission preliminarily estimated that the average one-time initial burden per large OATS-reporting broker-dealer would be 26,856 burden hours and external costs of \$900,000,³⁴⁴² for an estimated aggregate initial burden of 3,383,856 hours³⁴⁴³ and an estimated aggregate initial external cost of \$113,400,000.³⁴⁴⁴

³⁴⁴⁰ 26,856 initial burden hours per large OATS-reporting broker-dealer = (14.92 FTEs for implementation of CAT data reporting systems) x (1,800 working hours per year).

³⁴⁴¹ See CAT NMS Plan, supra note 5, at Section B.7(b)(iii)(C)(2)(a).

³⁴⁴² (\$750,000 in initial external hardware and software costs) + (\$150,000 initial external third party/outsourcing costs) = \$900,000 in initial external costs per large OATS-reporting broker-dealer to implement CAT data reporting systems.

³⁴⁴³ The Commission preliminarily estimates that 126 large OATS-reporting broker-dealers would be impacted by this information collection. 126 large OATS-reporting broker-

(b) Large OATS-Reporting Broker-Dealers – Ongoing Burden and Costs

In the Notice, the Commission preliminarily estimated that it would take a large OATS-reporting broker-dealer 18,054 ongoing burden hours per year³⁴⁴⁵ to continue compliance with the Rule. The Commission preliminarily estimated that it would cost, on average, approximately \$380,000 per year per large OATS-reporting broker-dealer to maintain systems connectivity to the Central Repository and purchase any necessary hardware, software, and other materials, and an additional \$120,000 in external ongoing third party/outsourcing costs.³⁴⁴⁶

Therefore, the Commission preliminarily estimated that the average ongoing annual burden per large OATS-reporting broker-dealer would be approximately 18,054 burden hours, plus \$500,000 in external costs³⁴⁴⁷ to maintain the systems necessary to collect and transmit

dealers x 26,856 burden hours = 3,383,856 initial burden hours to implement data reporting systems.

³⁴⁴⁴ (\$750,000 in initial external hardware and software costs) + (\$150,000 initial external third party/outsourcing costs) x 126 large OATS-reporting broker-dealers = \$113,400,000 in initial external costs to implement data reporting systems.

³⁴⁴⁵ 18,054 ongoing burden hours = (10.03 ongoing FTEs for maintenance of CAT data reporting systems) x (1,800 working hours per year).

³⁴⁴⁶ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b).

³⁴⁴⁷ (\$380,000 in ongoing external hardware and software costs + \$120,000 in ongoing external third party/outsourcing costs) = \$500,000 in ongoing external costs per large OATS-reporting broker-dealer.

information to the Central Repository, for an estimated aggregate burden of 2,274,804 hours³⁴⁴⁸ and an estimated aggregate ongoing external cost of \$63,000,000.³⁴⁴⁹

B. Outsourcers

i. Small OATS-Reporting Broker-Dealers

Based on data provided by FINRA, the Commission estimates that there are 806 broker-dealers that report fewer than 350,000 OATS ROEs monthly. The Commission believes that these broker-dealers generally outsource their regulatory reporting obligations because during the period June 15-July 10, 2015, approximately 88.9% of their 350,000 OATS ROEs were reported through service bureaus, with 730 of these broker-dealers reporting more than 99% of their OATS ROEs through one or more service bureaus.³⁴⁵⁰ The Commission estimates that these firms currently spend an aggregate of \$100.1 million on annual outsourcing costs.³⁴⁵¹ The Commission estimates these 806 broker-dealers would spend \$100.2 million in aggregate to outsource their regulatory data reporting to service bureaus to report in accordance with Rule 613,³⁴⁵² or \$124,373 per broker-dealer.³⁴⁵³ These external outsourcing cost estimates are

³⁴⁴⁸ The Commission preliminarily estimates that 126 large OATS-reporting broker-dealers would be impacted by this information collection. (126 large OATS-reporting broker-dealers) x (18,054 burden hours) = 2,274,804 aggregate ongoing burden hours.

³⁴⁴⁹ (\$380,000 in ongoing external hardware and software costs + \$120,000 in ongoing external third party/outsourcing costs) x 126 large OATS-reporting broker-dealers = \$63,000,000 in aggregate ongoing external costs.

³⁴⁵⁰ See Notice, supra note 5, at 30718. Because of the extensive use of service bureaus in these categories of broker-dealers, the Commission assumes that these broker-dealers are likely to use service bureaus to accomplish their CAT data reporting.

³⁴⁵¹ The average broker-dealer in this category reported 15,185 OATS ROEs from June 15-July 10, 2015; the median reported 1,251 OATS ROEs. Of these broker-dealers, 39 reported more than 100,000 OATS ROEs during the sample period. See Section V.F.1.c.(2)B., supra.

³⁴⁵² Id.

calculated using the information from staff discussions with service bureaus and other market participants, as applied to data provided by FINRA.³⁴⁵⁴

Firms that outsource their regulatory data reporting would still face internal staffing burdens associated with this activity. These employees would perform activities such as answering inquiries from their service bureaus, and investigating reporting exceptions. Based on conversations with market participants, the Commission estimates that these firms currently have 0.5 full-time employees devoted to these activities.³⁴⁵⁵ The Commission estimates that these firms would need to hire one additional full-time employee for one year to implement CAT reporting requirements.³⁴⁵⁶

Small OATS-reporting broker-dealers that outsource their regulatory data reporting would likely face internal staffing burdens and external costs associated with ongoing activity, such as maintaining any systems that transmit data to their service providers. Based on conversations with market participants, the Commission estimates these firms would need 0.75 FTEs on an ongoing basis to perform or monitor CAT reporting.³⁴⁵⁷

(a) Small OATS-Reporting Broker-Dealers – Initial Burden and Costs

In the Notice, the Commission preliminarily estimated that the average initial burden to implement the needed systems changes to capture the required information and transmit it to the

³⁴⁵³ \$124,373 = \$100,200,000 / 806 broker-dealers. This amount is the average estimated annual outsourcing cost to firms that currently report fewer than 350,000 OATS ROEs per month. Id.

³⁴⁵⁴ See Section V.F.1.c.(2)B., supra.

³⁴⁵⁵ Id.

³⁴⁵⁶ Id.

³⁴⁵⁷ See Section IV.F.1.c.(2)B., supra.

Central Repository in compliance with the CAT NMS Plan for small OATS-reporting broker-dealers would be approximately 1,800 burden hours.³⁴⁵⁸ The Commission believed the burden hours would be associated with work performed by internal technology, compliance and legal staff in connection with the implementation of CAT data reporting. The Commission also preliminarily estimated that each small OATS-reporting broker-dealer would incur approximately \$124,373 in initial external outsourcing costs.³⁴⁵⁹

Therefore, the Commission preliminarily estimated that the average one-time initial burden per small OATS-reporting broker-dealer would be 1,800 burden hours and external costs of \$124,373, for an estimated aggregate initial burden of 1,450,800 hours³⁴⁶⁰ and an estimated aggregate initial external cost of \$100,244,638.³⁴⁶¹

³⁴⁵⁸ This estimate assumed that, based on the expected FTE count provided, a small OATS-reporting broker-dealer would have to hire 1 new FTE for implementation. The salary attributed to the 1 FTE would be (1 x \$424,350 FTE cost) = \$424,350 per year. To determine the number of burden hours to be incurred by the current 0.5 FTE for implementation, multiply 0.5 FTE by 1,800 hours per year = 900 initial burden hours.

³⁴⁵⁹ The Commission preliminarily believed the outsourcing cost would be the cost of the service bureau, which would include the compliance and legal costs associated with changing to CAT Data reporting. The Commission assumes these costs of changing to CAT Data reporting would be included in the cost of the service bureau because the broker-dealers would be relying on the expertise of the service bureau to report their data to CAT on their behalf. See Notice, supra note 5, at Section IV.F.1.C(2), n. 941.

³⁴⁶⁰ The Commission preliminarily estimates that 806 small OATS-reporting broker-dealers would be impacted by this information collection. (806 small OATS-reporting broker-dealers x 1,800 burden hours) = 1,450,800 aggregate initial burden hours.

³⁴⁶¹ (\$124,373 in outsourcing costs) x (806 small OATS-reporting broker-dealers) = \$100,244,638 in aggregate initial external costs.

(b) Small OATS-Reporting Broker-Dealers – Ongoing Burden and Costs

In the Notice, the Commission preliminarily believed that it would take a small OATS-reporting broker-dealer 1,350 ongoing burden hours per year³⁴⁶² to continue compliance with the Rule. The Commission preliminarily believed the burden hours would be associated with work performed by internal technology, compliance and legal staff in connection with the ongoing operation of CAT Data reporting. The Commission preliminarily estimated that it would cost, on average, approximately \$124,373 in ongoing external outsourcing costs³⁴⁶³ to ensure ongoing compliance with Rule 613.

Therefore, the Commission preliminarily estimated that the average ongoing annual burden per small OATS-reporting broker-dealer would be approximately 1,350 hours, plus \$124,373 in external costs, for an estimated aggregate ongoing burden of 1,088,100 hours³⁴⁶⁴ and an estimated aggregate ongoing external cost of \$100,244,638.³⁴⁶⁵

ii. Small non-OATS-Reporting Broker-Dealers

In addition to firms that currently report to OATS, the Commission estimates there are 799 broker-dealers that are currently exempt from OATS reporting rules due to firm size, or excluded because all of their order flow is routed to a single OATS reporter, such as a clearing

³⁴⁶² 1,350 ongoing burden hours = (0.75 FTE for maintenance of CAT Data reporting systems) x (1,800 working hours per year).

³⁴⁶³ See Notice, supra note 5, at Section IV.F.1.c(2)B.ii. See supra note 3459.

³⁴⁶⁴ The Commission preliminarily estimates that 806 small OATS-reporting broker-dealers would be impacted by this information collection. (806 small OATS-reporting broker-dealers x 1,350 burden hours) = 1,088,100 aggregate ongoing burden hours to ensure ongoing compliance with Rule 613.

³⁴⁶⁵ \$100,244,638 = \$124,373 in ongoing outsourcing costs x 806 broker-dealers.

firm, that would incur CAT reporting obligations.³⁴⁶⁶ A further 24 broker-dealers have SRO memberships only with one Participant;³⁴⁶⁷ the Commission believes this group is comprised mostly of floor brokers and further believes these firms would experience CAT implementation and ongoing reporting costs similar in magnitude to small equity broker-dealers that currently have no OATS reporting responsibilities.³⁴⁶⁸

The Commission assumes these broker-dealers would have very low levels of CAT reporting, similar to those of the lowest activity firms that currently report to OATS. For these firms, the Commission assumes that under CAT they would incur the average estimated service bureau cost of broker-dealers that currently report fewer than 350,000 OATS ROEs per month, which is \$124,373 annually.³⁴⁶⁹ Furthermore, because these firms have more limited data reporting requirements than other firms, the Commission assumes these firms currently have only 0.1 full-time employees currently dedicated to regulatory data reporting activities.³⁴⁷⁰ The Commission assumes these firms would require 2 full-time employees for one year to implement CAT.³⁴⁷¹

Small non-OATS-reporting broker-dealers that outsource their regulatory data reporting would likely face internal staffing burdens and costs associated with ongoing activity, such as

³⁴⁶⁶ See Section V.F.1.c.(2)B., supra. Rule 613 does not exclude from data reporting obligations SRO members that quote or execute transactions in NMS Securities and Listed Options that route to a single market participant; see also CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(B)(2).

³⁴⁶⁷ See Section V.F.1.c.(2)B., supra.

³⁴⁶⁸ Id.

³⁴⁶⁹ Id.

³⁴⁷⁰ Id.

³⁴⁷¹ Id.

maintaining any systems that transmit data to their service providers. Based on conversations with market participants, the Commission estimates these firms would need 0.75 full-time employees annually to perform or monitor CAT reporting.

(a) Small non-OATS-Reporting Broker-Dealers – Initial Burden and Costs

In the Notice, the Commission preliminarily estimated that the average initial burden to develop and implement the needed systems changes to capture the required information and transmit it to the Central Repository in compliance with the Rule for small, non-OATS-reporting broker-dealers would be approximately 3,600 initial burden hours.³⁴⁷² The Commission believed the burden hours would be associated with work performed by internal technology, compliance and legal staff in connection with the implementation of CAT Data reporting. The Commission also preliminarily estimated that each small non-OATS-reporting broker-dealer would incur approximately \$124,373 in initial external outsourcing costs.³⁴⁷³

Therefore, the Commission preliminarily estimated that the average one-time initial burden per small OATS-reporting broker-dealer would be 3,600 burden hours and external costs of \$124,373 for an estimated aggregate initial burden of 2,962,800 hours³⁴⁷⁴ and an estimated aggregate initial external cost of \$102,358,979.³⁴⁷⁵

³⁴⁷² 3,600 initial burden hours = (2 FTEs for implementation of CAT Data reporting systems) x (1,800 working hours per year).

³⁴⁷³ See Section V.F.1.c.(2)B., supra.

³⁴⁷⁴ The Commission preliminarily estimates that 823 small non-OATS-reporting broker-dealers would be impacted by this information collection. (823 small non-OATS-reporting broker-dealers x 3,600 burden hours) = 2,962,800 aggregate initial burden hours.

³⁴⁷⁵ (\$124,373 in outsourcing costs) x (823 small non-OATS-reporting broker-dealers) = \$102,358,979 in aggregate initial external costs.

(b) Small non-OATS-Reporting Broker-Dealers – Ongoing Burden and Costs

In the Notice, the Commission preliminarily believed that it would take a small non-OATS-reporting broker-dealer 1,350 ongoing burden hours per year³⁴⁷⁶ to continue compliance with the Rule. The Commission preliminarily estimated that it would cost, on average, approximately \$124,373 in ongoing external outsourcing costs³⁴⁷⁷ to ensure ongoing compliance with Rule 613.

Therefore, the Commission preliminarily estimated that the average ongoing annual burden per small non-OATS-reporting broker-dealer would be approximately 1,350 hours, plus \$124,373 in external costs, for an estimated aggregate ongoing burden of 1,111,050 hours³⁴⁷⁸ and an estimated aggregate ongoing external cost of \$102,358,979.³⁴⁷⁹

(2) Comments/ Responses on Broker-Dealer Data Collection and Reporting Costs

As noted above, the Commission's estimates are based on whether broker-dealers currently insource or outsource, or are likely to insource or outsource, their CAT Data reporting obligations. The Commission provided in the Notice an analysis of the compliance cost

³⁴⁷⁶ 1,350 ongoing burden hours = (0.75 FTEs for maintenance of CAT data reporting systems) x (1,800 working hours per year).

³⁴⁷⁷ The Commission assumed these firms would have very low levels of CAT reporting, similar to those of the lowest activity firms that currently report to OATS. For these firms, the Commission assumes that under CAT they would incur the average estimated service bureau cost of firms that currently OATS report fewer than 350,000 OATS ROEs per month of \$124,373 annually.

³⁴⁷⁸ The Commission preliminarily estimated that 823 small non-OATS-reporting broker-dealers would be impacted by this information collection. (823 small non-OATS-reporting broker-dealers x 1,350 burden hours) = 1,111,050 aggregate ongoing burden hours to ensure ongoing compliance with Rule 613.

³⁴⁷⁹ (\$124,373 in ongoing external outsourcing costs) x 823 = \$102,358,979 in aggregate ongoing external costs to ensure ongoing compliance with Rule 613.

estimates for broker-dealers that included analyzing whether estimates provided in the Plan and based on a Reporters Study survey were reliable.³⁴⁸⁰ The Commission preliminarily believed that the cost estimates for small broker-dealers were not reliable. The Commission then developed and calibrated its Outsourcing Cost Model to estimate average current data reporting costs and average Plan compliance costs for broker-dealers that the Commission expects will rely on service bureaus to perform their CAT Data reporting responsibilities (Outsourcers).³⁴⁸¹ For the Insourcers, the Commission continued to rely on the large broker-dealer estimates from the Plan.³⁴⁸² The Commission's preliminary initial and ongoing burden hour and cost estimates, as well as the Plan's estimates, are aggregate estimates for a broker-dealer's compliance with the data collection and reporting requirement under Rule 613; they do not quantify the burden hours or external cost estimates for each individual component comprising the broker-dealer's data collection and reporting responsibility.

The Commission received comments on the reliability of its Outsourcing Cost Model for small broker-dealers and its re-estimation of costs. One commenter believed that the Commission's estimates of service bureau charges for a small firm were reasonable.³⁴⁸³ Another commenter noted that Outsourcers must expend internal resources even when relying on their service providers to accomplish current data reporting.³⁴⁸⁴ A third commenter stated that broker-

³⁴⁸⁰ See Notice, supra note 5, at 30712–26.

³⁴⁸¹ See Section V.F.1.c(1), supra.

³⁴⁸² Id.

³⁴⁸³ See Data Boiler Letter at 36.

³⁴⁸⁴ Specifically, this commenter references EBS reporting, but indicates that Industry Members sometimes must also be involved in preparing EBS request responses. See FIF Letter at 34.

dealers that clear for others may have higher implementation costs since they may have to support more broker-dealers as a result of the CAT.³⁴⁸⁵

With respect to the comment that the Outsourcing Cost Model does not account for internal expenses, the Commission notes that its cost estimates explicitly assume that Outsourcers have employee expenses that cover these activities.³⁴⁸⁶ In response to the commenters concerned that the Commission's estimates do not account for an increase in costs for broker-dealers that clear for other broker-dealers or provide support to introducing broker-dealers, the Commission continues to believe in the reliability of the analysis of broker-dealers implementation costs presented in the Notice, and notes that the Reporters Study estimates for large broker-dealers are likely to include these expenses because respondents are likely to include broker-dealers that provide these services. The Commission acknowledges, however, that there are some broker-dealers that would be classified as Outsourcers or new reporters and the additional implementation costs that these firms face due to clearing for other broker-dealers or supporting introducing broker-dealers are not captured by the Outsourcing Cost Model. The Commission cannot estimate the number of broker-dealers that would bear these costs because the Commission lacks data on the number of broker-dealers that clear for other broker-dealers that would be classified as new reporters or Outsourcers. Furthermore, the Commission lacks data to estimate the magnitude of these costs because the Plan does not provide this data and the Commission is unaware of any data available to it that it could use to estimate these costs.

³⁴⁸⁵ See TR Letter, at 3–4.

³⁴⁸⁶ See Notice, supra note 5, at 30723.

The Commission also received several comments on uncertainties in the cost estimates for broker-dealers arising from not knowing the choice of Plan Processor,³⁴⁸⁷ not having Technical Specifications,³⁴⁸⁸ differences in bids preventing broker-dealers from providing more definitive cost estimates,³⁴⁸⁹ and a lack of detail in the CAT NMS Plan.³⁴⁹⁰

In response to comment letters that identified these sources of uncertainties related to the costs broker-dealers will incur, the Commission acknowledges that such costs depend on the technical specifications, which are likely to remain unknown until the Plan Processor is selected. The Commission also notes that final Bids will not be submitted until after the Plan is approved, so the Commission is unable to quantify the degree of variation in broker-dealer implementation costs across Bids.

Additionally, the Commission received a number of comments relating to the costs of the individual components comprising the broker-dealer data collection and reporting requirement, such as customer information, the open/close indicator for equities, listing exchange symbology, allocation report timestamp, and quote sent time. In the Notice, as noted above, the Commission provided aggregate burden hour and external cost estimates for the broker-dealer data collection and reporting requirement of Rule 613. Although the costs of these specific data elements were not discussed in the Notice Paperwork Reduction Act analysis, the Commission has considered these comments because they relate to the overall data collection and reporting information collection.

³⁴⁸⁷ TR Letter at 4; FSI Letter at 6.

³⁴⁸⁸ See, e.g., FSR Letter at 10; and Fidelity Letter at 6.

³⁴⁸⁹ FSI Letter at 6.

³⁴⁹⁰ SIFMA Letter at 42 and FSI Letter at 6.

A. Customer Information

In the Notice, the Commission stated that it believed the requirement in the CAT NMS Plan to report customer information for each transaction represents a significant source of costs.³⁴⁹¹ One commenter believed that the costs for providing customer information to the Central Repository would comprise a significant proportion of costs to the total industry and that the costs associated with the management of sensitive information could increase costs.³⁴⁹²

Two commenters stated that including Customer Identifying Information on new order reports would result in significant costs for the industry.³⁴⁹³ In Response Letter I, the Participants suggested that the Commission amend (and the Commission has accordingly amended) the CAT NMS Plan to clarify that Customer Identifying Information and Customer Account Information would not be reported with the original receipt or origination of an order.³⁴⁹⁴

One commenter requested clarification that only active accounts would be reported as part of the customer definition process, which could reduce costs incurred for reporting customer information.³⁴⁹⁵ In Response Letter I, the Participants suggested that the Commission amend the Plan to add a definition of “Active Account,” defined as an account that has had activity in Eligible Securities within the last six months. Additionally, the Participants suggested that the Commission amend (and the Commission has amended) Section 6.4(d)(iv) of the Plan by

³⁴⁹¹ See Notice, supra note 5, at Section IV.F.3.a.

³⁴⁹² Data Boiler Letter at 37.

³⁴⁹³ TR Letter at 8–9; FIF Letter at 9–10, 86.

³⁴⁹⁴ Response Letter I at 34.

³⁴⁹⁵ FIF Letter at 10.

clarifying that each broker-dealer must submit an initial set of customer information for Active Accounts at the commencement of reporting to the Central Repository, as well as any updates, additions, or other changes in customer information, including any such customer information for any new Active Accounts.³⁴⁹⁶

The Commission considered these comments and the Participants' responses and continues to believe that the requirement in the CAT NMS Plan to report customer information represents a significant proportion of total costs to the industry. The Commission is not amending its broker-dealer data collection and reporting external cost estimates in response to commenters. Commenters did not provide cost estimates that would allow the Commission to estimate such costs, and the amendments to the Plan clarify that the Plan does not require customer information to be reported on order origination.

B. Open/Close Indicator for Equities

The Commission received comments on the costs to report an open/close indicator on orders to buy or sell equities. Several commenters agreed with the Commission's analysis that an open/close indicator represents a significant proportion of costs to the Plan.³⁴⁹⁷ Two commenters indicated that it would require significant process changes across multiple systems,³⁴⁹⁸ and one provided a list of the different types of systems impacted by the open/close indicator.³⁴⁹⁹ Some commenters mentioned that the open/close indicator is currently not

³⁴⁹⁶ Response Letter I at 35.

³⁴⁹⁷ TR Letter at 9; SIFMA Letter at 35–36; FIF Letter at 83–86.

³⁴⁹⁸ SIFMA Letter at 35; FIF Letter at 4, 84.

³⁴⁹⁹ FIF Letter at 84.

populated for equities.³⁵⁰⁰ Further, several commenters implied that the costs of the open/close indicator were not included in the cost estimates in the Notice.³⁵⁰¹ In Response Letter I, the Participants indicated that the open/close indicator is not captured on equities or on certain options transactions such as Options' Market Maker transactions.³⁵⁰²

The Commission considered these comments and is modifying the Plan to eliminate the requirement to report an open/close indicator for equities and on Options Market Maker quotations. Although the Commission believes this will reduce the compliance costs for broker-dealers, Participants, and the Central Repository, the Commission cannot quantify the savings and is thus not amending its external cost estimates in response to commenters.

The Participants' statement that open/close indicators are not reported on some options orders is consistent with the Commission's experience and the analysis in the Notice. While the economic analysis in the Notice did not explicitly separate the costs associated with an open/close indicator for equities and an open/close indicator for options, the Commission believes that the costs of the open/close indicator for options are included in the cost estimates of the Notice. However, because the Plan will no longer require the reporting of the open/close indicator for Options Market Maker quotations, the Commission now believes there will be an additional cost savings associated with not having to report this indicator as part of CAT.

³⁵⁰⁰ TR Letter at 9, FIF Letter at 4, 83–85, SIFMA Letter at 35.

³⁵⁰¹ Specifically, one commenter stated that the inclusion of the open/close indicator for equities was a surprise (FIF Letter at 84) and two commenters wanted additional cost benefit analysis on the open/close indicator (FIF Letter at 84; SIFMA Letter at 36).

³⁵⁰² Response Letter I at 21, 22.

C. Listing Exchange Symbology

In the Notice, the Commission explained its belief that the requirement to use listing exchange symbology could represent a significant source of costs,³⁵⁰³ because broker-dealers do not necessarily use listing exchange symbology when placing orders on other exchanges or off-exchange. One commenter stated that it did not expect the use of listing exchange symbology to be much more costly than the use of existing symbology.³⁵⁰⁴ However, another commenter suggested that accepting only listing exchange symbology is costly and invasive.³⁵⁰⁵ One other commenter stated that listing exchange symbology would also be a significant source of costs to options.³⁵⁰⁶ The Participants responded in Response Letter II that it was their understanding that all broker-dealers subject to OATS or EBS reporting requirements currently use the listing exchange symbology when submitting such reports.³⁵⁰⁷ Further, they stated in Response Letter III that broker-dealers currently use symbology translation solutions when submitting data to exchanges or when submitting to regulatory reporting systems such as OATS or EBS.³⁵⁰⁸

The Commission considered the comments and now believes that the incremental cost for CAT Reporters to translate from their existing symbology to listing exchange symbology would be less than as discussed in the Notice and would not be a substantial contributor to aggregate costs. The Commission is not amending its external cost estimates for broker-dealer data collection and reporting in response to commenters.

³⁵⁰³ See Notice, supra note 5, at 30730–30731.

³⁵⁰⁴ FIF Letter at 12, 95.

³⁵⁰⁵ Data Boiler Letter at 37–38.

³⁵⁰⁶ Bloomberg Letter at 5.

³⁵⁰⁷ Response Letter II at 7.

³⁵⁰⁸ Response Letter III at 13.

D. Allocation Report Timestamp

Several commenters noted that there would be costs associated with reporting timestamps on allocation reports.³⁵⁰⁹ One of these commenters mentioned that the requirement to report allocation timestamps would mean that broker-dealers would incur unnecessary costs to acquire additional resources.³⁵¹⁰ One commenter estimated that the currently proposed allocation timestamp requirement, with a one millisecond timestamp granularity and a 50 millisecond clock offset, would cost the industry \$88,775,000 in initial implementation costs and \$13,925,000 in ongoing annual costs.³⁵¹¹ The commenter further estimated that a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset, would cost the industry \$44,050,000 in initial implementation costs and \$5,035,833 in ongoing annual costs.³⁵¹² In Response Letter I, the Participants recommended an amendment to the Plan that would specify a one-second timestamp for allocation time on Allocation Reports,³⁵¹³ and the Commission is amending the Plan to reflect this recommendation.

The Commission considered these comments and is increasing its external cost estimates for broker-dealer data collection and reporting in response to the comments. The Commission is now adding one commenter's estimate of \$44,050,000 in implementation costs and \$5,035,833 in ongoing costs to the estimates of costs to broker-dealers.³⁵¹⁴ The Commission believes the

³⁵⁰⁹ FSR Letter, at 9; SIFMA Letter, at 35; FIF Letter, at 3–4, 11, 86–89.

³⁵¹⁰ FSR Letter at 9.

³⁵¹¹ FIF Letter at 87–89.

³⁵¹² FIF Letter at 88, Table 6.

³⁵¹³ Response Letter I at 25.

³⁵¹⁴ See Section V.F.3.a(4), supra. The total cost estimates of the CAT Plan reflect these implementation and ongoing costs.

cost estimates received to be credible because they are based on a survey of industry participants who are informed of the Allocation Time requirement and the changes that broker-dealers would need to make to comply with the requirement.

E. Quote Sent Time

In the Notice, the Commission estimated that the requirement that Options Market Makers submit quote sent times to the exchanges would cost between \$36.9 million and \$76.8 million over five years.³⁵¹⁵ The Commission concluded that this requirement did not represent a significant source of costs. The Commission received a comment stating that the estimated 5-year cost to Options Market Makers for adding a timestamp to the quote times was between the range of \$39.9 million and \$76.8 million. The commenter further stated that this is “not a trivial cost for providing one data element to the consolidated audit trail.”³⁵¹⁶ The Commission continues to believe that the estimates in the Notice are credible estimates for the costs for Options Market Makers to send the Quote Sent Time field to exchanges. In response to the comment, the Commission notes that the implied annual costs would be much lower than the five year costs and the Commission agrees that the costs of quote sent time are significant.

The Quote Sent Time cost estimate was not included in the cost estimates in the Notice, therefore the Commission is now adding this cost to its estimates for Options Market Maker data collection and reporting.³⁵¹⁷ The Commission is using the maximum 5-year cost estimate to

³⁵¹⁵ See FIF, SIFMA, and Security Traders Association, Cost Survey Report on CAT Reporting of Options Quotes by Market Makers (November 5, 2013), available at <http://www.catnmsplan.com/industryfeedback/p601771.pdf>; see also CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iv)(B).

³⁵¹⁶ FIF Letter at 65.

³⁵¹⁷ See Section V.F.1.c(2)B, supra.

Options Market Makers provided by the commenter (\$76.8 million) and has divided it into \$17,400,000 in aggregate implementation external costs, and \$11,880,000 in aggregate ongoing external costs,³⁵¹⁸ as provided in the burden hours and external cost estimates discussion for Options Market Makers in Section VI.D.2.a.(3)A.i.(b), below.

(3) Order Estimates

A. Insourcers

i. Large Non-OATS Reporting Broker-Dealers

The Commission notes that, in this Order Paperwork Reduction Act analysis, the Commission has divided the discussion of the burden hours and cost estimates associated with large non-OATS-reporting broker-dealers into two separate categories: ELPs and Options Market Makers. The Commission believes that it is necessary to discuss these categories separately to account for the addition of the Quote Sent Time cost to the external costs to be incurred solely by Options Market Makers.

(a) Electronic Liquidity Providers

As noted above,³⁵¹⁹ in the CAT NMS Plan, the Participants, based on the Reporters Study's large broker-dealer cost estimates, estimated the following average initial external cost and FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to adopt the systems changes needed to comply with the data reporting requirements of Rule 613

³⁵¹⁸ The Commission assumes that the ratio of ongoing to implementation costs for Quote Sent Time would be the same as the ratio of ongoing to implementation costs for the other costs incurred by broker-dealers for data collection and reporting to CAT. See supra note 2526; see also Section V.F.3.a(6), supra.

³⁵¹⁹ See Section VI.D.2.a.(1)A.i., supra.

under Approach 1: \$450,000 in external hardware and software costs; 8.05 internal FTEs;³⁵²⁰ and \$9,500 in external third party/outsourcing costs.³⁵²¹ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$80,000 in external hardware and software costs; 7.41 internal FTEs;³⁵²² and \$1,300 in external third party/outsourcing costs.³⁵²³ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$80,000 in external hardware and software costs; 7.41 internal FTEs;³⁵²⁴ and \$1,300 in external third party/outsourcing costs.³⁵²⁵

³⁵²⁰ Approach 1 also provided \$3,200,000 in initial internal FTE costs. The Commission believed the \$3,200,000 in internal FTE costs is the Participants' estimated cost of the 8.05 FTEs. (8.05 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$3,231,592. See CAT NMS Plan, supra note 5, at n. 192. See also supra note 3320.

³⁵²¹ See CAT NMS Plan, supra note 5, at Section B.7(b)(iii)(c)(2)(a). The Commission believed that the third party/outsourcing costs may be attributed to the use of service bureaus (potentially), technology consulting, and legal services.

³⁵²² Approach 1 also provided \$3,000,000 in internal FTE costs related to maintenance. The Commission believes the \$3,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 7.41 FTEs. (7.41 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$2,974,670. See CAT NMS Plan, supra note 5, at n.192. See also supra note 3320 .

³⁵²³ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not break down these third party costs into categories.

³⁵²⁴ Approach 1 also provided \$3,000,000 in internal FTE costs related to maintenance. The Commission believes the \$3,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 7.41 FTEs. (7.41 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$2,974,670. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192; see also supra note 3320.

As it did in the Notice, the Commission relies on the Reporters Study's large broker-dealer cost estimates in estimating costs for large broker-dealers that can practicably decide between insourcing or outsourcing their regulatory data reporting functions. The Commission estimates that there are 14 large broker-dealers that are not OATS reporters currently in the business of electronic liquidity provision that would be classified as Insourcers.³⁵²⁶

The Commission assumes the 14 ELPs would be typical of the Reporters Study's large, non-OATS reporting firms; for these firms, the Commission relies on the cost estimates provided under Approach 1³⁵²⁷ for large, non-OATS reporting firms in the CAT NMS Plan.

Once an ELP has established the appropriate systems and processes required for collection and transmission of the required information to the Central Repository, such broker-dealers would be subject to ongoing annual burdens associated with, among other things, personnel time to monitor each ELP's reporting of the required data and the maintenance of the

³⁵²⁵ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not break down these third party costs into categories.

³⁵²⁶ These broker-dealers are not FINRA members and thus have no regular OATS reporting obligations. See supra note 2560.

³⁵²⁷ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(A)(2). The Reporters Study requested broker-dealer respondents to provide estimates to report to the Central Repository under two approaches. Approach 1 assumes CAT Reporters would submit CAT Data using their choice of industry protocols. Approach 2 assumes CAT Reporters would submit data using a pre-specified format. Approach 1's aggregate costs are higher than those for Approach 2 for all market participants except in one case where service bureaus have lower Approach 1 costs. Id. at Section B.7(b)(iii)(C)(2). For purposes of this Paperwork Reduction Act analysis, the Commission is not relying on the cost estimates for Approach 2 because overall the Approach 1 aggregate estimates represent the higher of the proposed approaches. The Commission believes it would be more comprehensive to use the higher of the two estimates for its Paperwork Reduction Act analysis estimates.

systems to report the required data; and implementing changes to trading systems that might result in additional reports to the Central Repository.

(i) Electronic Liquidity
Providers – Initial Burden
and Costs

Based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁵²⁸ the Commission now estimates that the initial cost to an ELP to implement the modified allocation timestamp requirement would be \$250,000.³⁵²⁹ The Commission believes that this cost would be an external hardware and software cost related to adding this functionality to servers. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by ELPs.

³⁵²⁸ FIF Letter at 88, Table 6. The commenter based its implementation and ongoing estimates on a survey it conducted of broker-dealers to estimate the costs associated with the allocation report timestamp requirement. The commenter noted that the estimates do not account for all Insourcers (the cost estimates cover the 126 large OATS-reporting broker-dealer Insourcers, but not the 14 ELPs or 31 Options Market Makers), nor do they cover Outsourcing broker-dealers. The Commission believes those categories may not have been included in the estimates due to a lack of participation by such broker-dealers in the survey. The Commission is assuming, for its Paperwork Reduction Act cost estimates, that the portion of the estimates attributed by the commenter to service bureaus will be passed-through to their Outsourcing broker-dealer clients that rely on service bureaus to perform their regulatory data reporting. The Commission is thus applying the portion of the commenter's cost estimates attributed to the 126 Insourcers to all 171 Insourcers, as well as the portion of the cost estimates attributed to the 13 service bureaus across the 1,629 broker-dealers that are categorized as Outsourcing broker-dealers.

³⁵²⁹ The commenter stated that this requirement would cost the industry \$44,050,000 in initial implementation costs. The commenter attributed \$42,750,000 of the implementation cost estimate to 126 Insourcers. For purposes of this Paperwork Reduction Act analysis, the Commission is applying the portion of the cost estimates attributed to the 126 Insourcers to all 171 Insourcers. $\$42,750,000 / 171 \text{ Insourcers} = \$250,000$ in initial costs to implement the modified allocation timestamp requirement per Insourcer.

Based on this information, the Commission estimates that the average initial burden associated with implementing regulatory data reporting to capture the required information and transmit it to the Central Repository in compliance with the Rule for each ELP would be approximately 14,490 initial burden hours.³⁵³⁰

The Commission also now estimates that these broker-dealers would, on average, incur approximately \$700,000 in initial costs for hardware and software to implement the systems changes needed to capture the required information and transmit it to the Central Repository,³⁵³¹ and an additional \$9,500 in initial third party/outsourcing costs.³⁵³² Therefore, the Commission now estimates that the average one-time initial burden per ELP would be 14,490 internal burden hours, and the initial external cost per ELP would be \$709,500,³⁵³³ for an estimated aggregate initial burden of 202,860 hours³⁵³⁴ and an estimated aggregate initial external cost of \$9,933,000.³⁵³⁵

³⁵³⁰ 14,490 initial burden hours = (8.05 FTEs for implementing CAT Data reporting systems) x (1,800 working hours per year).

³⁵³¹ \$700,000 = (\$450,000 in initial hardware and software costs) + (\$250,000 in initial hardware and software costs to implement the modified allocation timestamp requirement).

³⁵³² See supra note 3436.

³⁵³³ (\$700,000 in initial hardware and software costs) + (\$9,500 initial third party/outsourcing costs) = \$709,500 in initial external costs to implement data reporting systems.

³⁵³⁴ The Commission estimates that 14 ELPs would be impacted by this information collection. (14 ELPs) x (14,490 burden hours) = 202,860 initial burden hours to implement data reporting systems.

³⁵³⁵ (\$709,500 in initial hardware and software costs) + (\$9,500 initial third party/outsourcing costs) x 14 ELPs = \$9,933,000 in initial external costs to implement data reporting systems.

(ii) Electronic Liquidity Providers – Ongoing Burden and Costs

Based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁵³⁶ the Commission now estimates that the ongoing cost to an ELP to maintain the modified allocation timestamp requirement would be \$29,166.67.³⁵³⁷ The Commission believes that this cost would be an external hardware and software cost related to maintenance of the modified allocation timestamp. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by ELPs.

Based on this information, the Commission believes that it would take an ELP 13,338 burden hours per year³⁵³⁸ to continue to comply with the Rule. The Commission also now estimates that it would cost, on average, approximately \$109,166.67 per year per ELP to maintain systems connectivity to the Central Repository and purchase any necessary hardware, software, and other materials,³⁵³⁹ and an additional \$1,300 in third party/outsourcing costs.³⁵⁴⁰

³⁵³⁶ See supra note 3528.

³⁵³⁷ The commenter stated that this requirement would cost the industry \$5,035,833 in ongoing costs. The commenter attributed \$4,987,500 of the ongoing cost estimate to 126 Insourcers. For purposes of this Paperwork Reduction Act analysis, the Commission is applying the portion of the cost estimates attributed to the 126 Insourcers to all 171 Insourcers. $\$4,987,500/171$ Insourcers = \$29,166.67 in ongoing costs to maintain the modified allocation timestamp requirement per Insourcer.

³⁵³⁸ $13,338$ ongoing burden hours = $(7.41$ ongoing FTEs to maintain CAT data reporting systems) x $(1,800$ working hours per year).

³⁵³⁹ $\$109,166.67 = (\$80,000$ in ongoing external hardware and software costs) + $(\$29,166.67$ to maintain the modified allocation timestamp requirement).

³⁵⁴⁰ See supra note 3421.

Therefore, the Commission now estimates that the average ongoing annual burden per ELP would be approximately 13,338 hours, and the ongoing external cost per ELP would be \$110,466.67³⁵⁴¹ to maintain the systems necessary to collect and transmit information to the Central Repository, for an estimated aggregate ongoing burden of 186,732 hours³⁵⁴² and an estimated aggregate ongoing external cost for the ELPs of \$1,546,533.38.³⁵⁴³

(b) Options Market Makers

As noted above,³⁵⁴⁴ in the CAT NMS Plan, the Participants, based on the Reporters Study's large broker-dealer cost estimates, estimated the following average initial external cost and FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to adopt the systems changes needed to comply with the data reporting requirements of Rule 613 under Approach 1: \$450,000 in external hardware and software costs; 8.05 internal FTEs;³⁵⁴⁵

³⁵⁴¹ (\$109,166.67 in ongoing external hardware and software costs) + (\$1,300 ongoing external third party/outsourcing costs) = \$110,466.6769 in ongoing external costs per ELP.

³⁵⁴² The Commission estimates that 14 ELPs would be impacted by this information collection. (14 ELPs) x (13,338 burden hours) = 186,732 aggregate ongoing burden hours.

³⁵⁴³ (\$109,166.67 in ongoing external hardware and software costs) + (\$1,300 ongoing external third party/outsourcing costs) x (14 ELPs) = \$1,546,533.38 in aggregate ongoing external costs.

³⁵⁴⁴ See Section VI.D.2.a.(1)A.i., supra.

³⁵⁴⁵ Approach 1 also provided \$3,200,000 in initial internal FTE costs. The Commission believed the \$3,200,000 in internal FTE costs is the Participants' estimated cost of the 8.05 FTEs. (8.05 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$3,231,592. See CAT NMS Plan, supra note 5, at n. 192. See also supra note 3320.

and \$9,500 in external third party/outsourcing costs.³⁵⁴⁶ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$80,000 in external hardware and software costs; 7.41 internal FTEs;³⁵⁴⁷ and \$1,300 in external third party/outsourcing costs.³⁵⁴⁸ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large non-OATS reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$80,000 in external hardware and software costs; 7.41 internal FTEs;³⁵⁴⁹ and \$1,300 in external third party/outsourcing costs.³⁵⁵⁰ As it did in the Notice, the Commission relies on the Reporters Study's large broker-dealer cost estimates in estimating costs for large broker-dealers that can practicably decide between insourcing or outsourcing their

³⁵⁴⁶ See CAT NMS Plan, supra note 5, at Section B.7(b)(iii)(c)(2)(a). The Commission believed that the third party/outsourcing costs may be attributed to the use of service bureaus (potentially), technology consulting, and legal services.

³⁵⁴⁷ Approach 1 also provided \$3,000,000 in internal FTE costs related to maintenance. The Commission believes the \$3,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 7.41 FTEs. (7.41 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$2,974,670. See CAT NMS Plan, supra note 5, at n.192. See also supra note 3320.

³⁵⁴⁸ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not break down these third party costs into categories.

³⁵⁴⁹ Approach 1 also provided \$3,000,000 in internal FTE costs related to maintenance. The Commission believes the \$3,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 7.41 FTEs. (7.41 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$2,974,670. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192; see also supra note 3320.

³⁵⁵⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not break down these third party costs into categories.

regulatory data reporting functions.³⁵⁵¹ The Commission estimates that there are 31 broker-dealers that may transact in options but not in equities that can be classified as Insourcers.³⁵⁵² Although the exemptive relief may relieve these firms of the obligation to report their options quoting activity to the Central Repository, these firms may have customer orders and other activity off-exchange that would cause them to incur a CAT reporting obligation. The Commission assumes the 31 Options Market Makers would be typical of the Reporters Study's large, non-OATS reporting firms; for these firms, the Commission relies on the cost estimates provided under Approach 1³⁵⁵³ for large, non-OATS reporting firms in the CAT NMS Plan.

Once an Options Market Maker has established the appropriate systems and processes required for collection and transmission of the required information to the Central Repository, such broker-dealers would be subject to ongoing annual burdens associated with, among other things, personnel time to monitor each Options Market Maker's reporting of the required data and the maintenance of the systems to report the required data; and implementing changes to trading systems that might result in additional reports to the Central Repository.

³⁵⁵¹ See CAT NMS Plan, supra note 5, at Appendix C, Section A.6(c).

³⁵⁵² See supra note 2562.

³⁵⁵³ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(i)(A)(2). The Reporters Study requested broker-dealer respondents to provide estimates to report to the Central Repository under two approaches. Approach 1 assumes CAT Reporters would submit CAT Data using their choice of industry protocols. Approach 2 assumes CAT Reporters would submit data using a pre-specified format. Approach 1's aggregate costs are higher than those for Approach 2 for all market participants except in one case where service bureaus have lower Approach 1 costs. Id. at Section B.7(b)(iii)(C)(2). For purposes of this Paperwork Reduction Act analysis, the Commission is not relying on the cost estimates for Approach 2 because overall the Approach 1 aggregate estimates represent the higher of the proposed approaches. The Commission believes it would be more comprehensive to use the higher of the two estimates for its Paperwork Reduction Act analysis estimates.

(i) Options Market Makers -
Initial Burden and Costs

Based on this information, the Commission estimates that the average initial burden associated with implementing regulatory data reporting to capture the required information and transmit it to the Central Repository in compliance with the Rule for each Options Market Maker would be approximately 14,490 initial burden hours.³⁵⁵⁴

The Commission also estimates that these options firm would, on average, incur approximately \$450,000 in initial costs for hardware and software to implement the systems changes needed to capture the required information and transmit it to the Central Repository, and an additional \$9,500 in initial third party/outsourcing costs.³⁵⁵⁵ Additionally, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁵⁵⁶ the Commission now estimates that the initial cost to an Options Market Maker to implement the modified allocation timestamp requirement would be \$250,000.³⁵⁵⁷ The Commission believes that this cost would be an external hardware and software cost related to adding this functionality to servers. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by Options Market Makers.

³⁵⁵⁴ 14,490 initial burden hours = (8.05 FTEs for implementing CAT Data reporting systems) x (1,800 working hours per year).

³⁵⁵⁵ See supra note 3436.

³⁵⁵⁶ See supra note 3528.

³⁵⁵⁷ The commenter stated that this requirement would cost the industry \$44,050,000 in initial implementation costs. The commenter attributed \$42,750,000 of the implementation cost estimate to 126 Insourcers. For purposes of this Paperwork Reduction Act analysis, the Commission is applying the portion of the cost estimates attributed to the 126 Insourcers to all 171 Insourcers. $\$42,750,000 / 171 \text{ Insourcers} = \$250,000$ in initial costs to implement the modified allocation timestamp requirement per Insourcer.

The Commission also is adding a cost estimate for the requirement that an Options Market Maker submit a Quote Sent Time to an exchange.³⁵⁵⁸ The Commission is using the maximum 5-year cost estimate to Options Market Makers provided by a commenter (\$76.8 million)³⁵⁵⁹ and has divided it into \$17,400,000 in aggregate implementation external costs, and \$11,880,000 in aggregate ongoing external costs.³⁵⁶⁰

The Commission estimates that that this requirement will impose an additional initial hardware and software cost per Options Market Maker of \$561,290.32.³⁵⁶¹ Based on this information, the Commission now estimates that Options Market Makers would, on average, incur approximately \$1,261,290.32 in initial costs for hardware and software to implement the systems changes needed to capture the required information and transmit it to the Central Repository,³⁵⁶² and an additional \$9,500 in initial third party/outsourcing costs. Therefore, the Commission now estimates that the average one-time initial burden per options firm would be 14,490 internal burden hours, and the initial external cost per Options Market Maker would be

³⁵⁵⁸ See Section VI.D.2.a.(1)E., supra; see also supra note 2526; Section V.F.3.a(6), supra; Section V.F.1.c(2)B., supra.

³⁵⁵⁹ FIF Letter at 65.

³⁵⁶⁰ See supra note 2526.

³⁵⁶¹ The Commission estimates that the implementation cost of the Quote Sent Time requirement is approximately \$17,400,000. See Section V.F.1.c(2)B., supra.
(\$17,400,000 in implementation costs) / (31 Options Market Makers) = \$561,290.21 in initial external costs to implement the Quote Sent Time requirement per Options Market Maker.

³⁵⁶² \$1,261,290.32 = (\$450,000 in initial hardware and software costs) + (\$250,000 in initial hardware and software costs to implement the modified allocation timestamp requirement) + (\$561,290.32 in initial hardware and software costs to implement the requirement that an Options Market Maker submit a Quote Sent Time).

\$1,270,790.32,³⁵⁶³ for an estimated aggregate initial burden of 449,190 hours³⁵⁶⁴ and an estimated aggregate initial external cost of \$39,394,499.92.³⁵⁶⁵

(ii) Options Market Makers -
Ongoing Burden and Costs

Based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁵⁶⁶ the Commission estimates that the ongoing cost to an Options Market Maker to maintain the modified allocation timestamp requirement would be \$29,166.67.³⁵⁶⁷ The Commission believes that this cost would be an external hardware and software cost related to maintenance of the modified allocation timestamp. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by Options Market Makers.

³⁵⁶³ (\$1,261,290.32 in initial hardware and software costs) + (\$9,500 initial third party/outsourcing costs) = \$1,270,790.32 in initial external costs to implement data reporting systems.

³⁵⁶⁴ The Commission estimates that 31 Options Market Makers would be impacted by this information collection. (31 Options Market Makers) x (14,490 burden hours) = 449,190 initial burden hours to implement data reporting systems.

³⁵⁶⁵ (\$1,270,790.32 in initial hardware and software costs) + (\$9,500 initial third party/outsourcing costs) x (31 Options Market Makers) = \$39,394,499.92 in initial external costs to implement data reporting systems.

³⁵⁶⁶ See supra note 3528.

³⁵⁶⁷ The commenter stated that this requirement would cost the industry \$5,035,833 in ongoing costs. The commenter attributed \$4,987,500 of the ongoing cost estimate to 126 Insourcers. For purposes of this Paperwork Reduction Act analysis, the Commission is applying the portion of the cost estimates attributed to the 126 Insourcers to all 171 Insourcers. \$4,987,500/171 Insourcers = \$29,166.67 in ongoing costs to maintain the modified allocation timestamp requirement per Insourcer.

The Commission also is adding a cost estimate for the requirement that an Options Market Maker submit a Quote Sent Time to an exchange.³⁵⁶⁸ The Commission is using the maximum 5-year cost estimate to Options Market Makers provided by a commenter (\$76.8 million)³⁵⁶⁹ and has divided it into \$17,400,000 in aggregate implementation external costs, and \$11,880,000 in aggregate ongoing external costs.³⁵⁷⁰ The Commission estimates that this requirement will impose an additional ongoing hardware and software cost per Options Market Maker of \$383,255.81.³⁵⁷¹ Based on this information, the Commission now believes that it would take an Options Market Maker 13,338 burden hours per year³⁵⁷² to continue to comply with the Rule. The Commission also now estimates that it would cost, on average, approximately \$492,422.48 per year per Options Market Maker to maintain systems connectivity to the Central Repository and purchase any necessary hardware, software, and other materials,³⁵⁷³ and an additional \$1,300 in third party/outsourcing costs.³⁵⁷⁴

³⁵⁶⁸ See Section VI.D.2.a.(1)E., supra; see also supra note 2526; Section V.F.3.a(6), supra; Section V.F.1.c(2)B., supra.

³⁵⁶⁹ FIF Letter at 65.

³⁵⁷⁰ See supra note 2526.

³⁵⁷¹ The Commission estimates that the ongoing cost of the Quote Sent Time requirement is approximately \$11,880,000. See Section V.F.1.c(2)B., supra. (\$11,880,000 in ongoing costs) / (31 Options Market Maker) = \$383,255.81 in ongoing external costs to maintain the Quote Sent Time requirement per Options Market Maker.

³⁵⁷² 13,338 ongoing burden hours = (7.41 ongoing FTEs to maintain CAT data reporting systems) x (1,800 working hours per year).

³⁵⁷³ \$492,422.48 = (\$80,000 in ongoing external hardware and software costs) + (\$29,166.67 to maintain the modified allocation timestamp requirement) + (\$383,255.81 in ongoing external costs to maintain the Quote Sent Time requirement per options firm).

³⁵⁷⁴ See supra note 3548.

Therefore, the Commission now estimates that the average ongoing annual burden per Options Market Maker would be approximately 13,338 hours, and the ongoing external cost per Options Market Maker would be \$493,722.48³⁵⁷⁵ to maintain the systems necessary to collect and transmit information to the Central Repository, for an estimated aggregate ongoing burden of 413,478 hours³⁵⁷⁶ and an estimated aggregate ongoing external cost to Options Market Makers of \$15,305,396.88.³⁵⁷⁷

ii. Large OATS-Reporting Broker-Dealers

As noted above,³⁵⁷⁸ in the CAT NMS Plan, the Participants, based on the Reporters Study's large broker-dealer cost estimates, estimated the following average initial external cost and internal FTE count figures that a large OATS-reporting broker-dealer would expect to incur as a result of the implementation of the consolidated audit trail under Approach 1: \$750,000 in hardware and software costs; 14.92 internal FTEs,³⁵⁷⁹ and \$150,000 in external third

³⁵⁷⁵ (\$492,422.48 in ongoing external hardware and software costs) + (\$1,300 ongoing external third party/outsourcing costs) = \$493,722.48 in ongoing external costs per options firm.

³⁵⁷⁶ The Commission estimates that 31 options firms would be impacted by this information collection. (31 options firms) x (13,338 burden hours) = 413,478 aggregate ongoing burden hours.

³⁵⁷⁷ (\$492,422.48 in ongoing external hardware and software costs) + (\$1,300 ongoing external third party/outsourcing costs) x (31 options firms) = \$15,305,396.88 in aggregate ongoing external costs.

³⁵⁷⁸ See Section VI.D.2.a.(1)(A)ii., supra.

³⁵⁷⁹ Approach 1 also provided \$6,000,000 in initial internal FTE costs. The Commission believes the \$6,000,000 in initial internal FTE costs is the Participants' estimated cost of the 14.92 FTEs. (14.92 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$5,989,485. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192; see also supra note 3320.

party/outsourcing costs.³⁵⁸⁰ The Participants also estimated the following average ongoing external cost and internal FTE count figures that a large OATS-reporting broker-dealer would expect to incur to maintain data reporting systems to be in compliance with Rule 613: \$380,000 in ongoing external hardware and software costs; 10.03 internal FTEs,³⁵⁸¹ and \$120,000 in ongoing external third party/outsourcing costs.³⁵⁸²

As it did in the Notice, based on the Commission's analysis of data provided by FINRA and discussions with market participants, the Commission estimates that 126 broker-dealers, which reported more than 350,000 OATS ROEs between June 15 and July 10, 2015, would strategically decide to either self-report CAT Data or outsource their CAT data reporting functions.³⁵⁸³ To conduct its Paperwork Burden Analysis for the 126 broker-dealers, the Commission is relying on the Reporters Study estimates used by the CAT NMS Plan of expected costs that a large OATS-reporting broker-dealer would incur as a result of the implementation of the consolidated audit trail under Approach 1.

³⁵⁸⁰ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(a). The CAT NMS Plan did not break down these third party costs into categories. The Commission believes that these costs may be attributed to the use of service bureaus, technology consulting, and legal services.

³⁵⁸¹ Approach 1 also provided \$4,000,000 in internal FTE costs related to maintenance. The Commission believes the \$4,000,000 in ongoing internal FTE costs is the Participants' estimated cost of the 10.03 FTEs. (10.03 FTEs) x (\$401,440 Participants' assumed annual cost per FTE provided in the CAT NMS Plan) = \$4,026,443. See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(C), n.192; see also supra note 3320.

³⁵⁸² See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b). The CAT NMS Plan did not categorize these third party costs. The Commission believes that these costs may be attributed to the use of service bureaus, technology consulting, and legal services.

³⁵⁸³ See Notice, supra note 5, at 30718; see also id., at n.901 (stating that the Commission believes that broker-dealers that report fewer than 350,000 OATS ROEs per month are unlikely to be large enough to support the infrastructure required for insourcing data reporting activities).

Once a large OATS-reporting broker-dealer has established the appropriate systems and processes required for collection and transmission of the required information to the Central Repository, such broker-dealers would be subject to ongoing annual burdens and costs associated with, among other things, personnel time to monitor each broker-dealer's reporting of the required data and the maintenance of the systems to report the required data; and implementing changes to trading systems which might result in additional reports to the Central Repository.

(a) Large OATS-Reporting Broker-Dealers – Initial Burden and Costs

In this Order, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁵⁸⁴ the Commission is estimating that the initial cost to a large OATS-reporting broker-dealer to implement the modified allocation timestamp requirement would be \$250,000.³⁵⁸⁵ The Commission believes that this cost would be an external hardware and software cost related to adding this functionality to servers. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by large-OATS-reporting broker-dealers.

Based on this information the Commission now estimates that these large OATS-reporting broker-dealers would, on average, incur approximately \$1,000,000 in initial external

³⁵⁸⁴ See supra note 3528.

³⁵⁸⁵ The commenter stated that this requirement would cost the industry \$44,050,000 in initial implementation costs. The commenter attributed \$42,750,000 of the implementation cost estimate to 126 Insourcers. For purposes of this Paperwork Reduction Act analysis, the Commission is applying the portion of the cost estimates attributed to the 126 Insourcers to all 171 Insourcers. $\$42,750,000 / 171 \text{ Insourcers} = \$250,000$ in initial costs to implement the modified allocation timestamp requirement per Insourcer.

costs for hardware and software to implement the systems changes needed to capture the required information and transmit it to the Central Repository,³⁵⁸⁶ and an additional \$150,000 in initial external third party/outsourcing costs.³⁵⁸⁷ Therefore, the Commission now estimates that the average one-time initial burden per large OATS-reporting broker-dealer would be 26,856 burden hours and external costs of \$1,150,000 to implement CAT data reporting systems,³⁵⁸⁸ for an estimated aggregate initial burden of 3,383,856 hours³⁵⁸⁹ and an estimated aggregate initial external cost of \$189,000,000.³⁵⁹⁰

(b) Large OATS-Reporting
Broker-Dealers - Ongoing
Burden and Costs

In this Order, additionally, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁵⁹¹ the Commission estimates that the ongoing cost to a large OATS-reporting broker-dealer to maintain the modified allocation timestamp requirement would be

³⁵⁸⁶ \$1,000,000 = (\$750,000 in initial external hardware and software costs) + (\$250,000 to implement the modified allocation timestamp).

³⁵⁸⁷ See supra note 3421.

³⁵⁸⁸ (\$1,000,000 in initial external hardware and software costs) + (\$150,000 initial external third party/outsourcing costs) = \$1,150,000 in initial external costs per large OATS-reporting broker-dealer to implement CAT data reporting systems.

³⁵⁸⁹ The Commission estimates that 126 large OATS-reporting broker-dealers would be impacted by this information collection. (126 large OATS-reporting broker-dealers) x (26,856 initial burden hours) = 3,383,856 initial burden hours to implement data reporting systems.

³⁵⁹⁰ (\$1,000,000 in initial external hardware and software costs) + (\$150,000 initial external third party/outsourcing costs) x (126 large OATS-reporting broker-dealers) = \$189,000,000 in initial external costs to implement data reporting systems.

³⁵⁹¹ See supra note 3528.

\$29,166.67.³⁵⁹² The Commission believes that this cost would be an external hardware and software cost related to maintenance of the modified allocation timestamp. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by large OATS-reporting broker-dealers.

Based on this information the Commission believes that it would take a large OATS-reporting broker-dealer 18,054 ongoing burden hours per year³⁵⁹³ to continue compliance with the Rule. The Commission now estimates that it would cost, on average, approximately \$409,166.67 per year per large OATS-reporting broker-dealer to maintain systems connectivity to the Central Repository and purchase any necessary hardware, software, and other materials,³⁵⁹⁴ and an additional \$120,000 in external ongoing third party/outsourcing costs.³⁵⁹⁵

Therefore, the Commission now estimates that the average ongoing annual burden per large OATS-reporting broker-dealer would be approximately 18,054 burden hours, plus \$529,166.67³⁵⁹⁶ to maintain the systems necessary to collect and transmit information to the

³⁵⁹² The commenter stated that this requirement would cost the industry \$5,035,833 in ongoing costs. The commenter attributed \$4,987,500 of the ongoing cost estimate to 126 Insourcers. For purposes of this Paperwork Reduction Act analysis, the Commission is applying the portion of the cost estimates attributed to the 126 Insourcers to all 171 Insourcers. $\$4,987,500 / 171 \text{ Insourcers} = \$29,166.67$ in ongoing costs to maintain the modified allocation timestamp requirement per Insourcer.

³⁵⁹³ $18,054 \text{ ongoing burden hours} = (10.03 \text{ ongoing FTEs for maintenance of CAT data reporting systems}) \times (1,800 \text{ working hours per year})$.

³⁵⁹⁴ $\$409,166.67 = (\$380,000 \text{ in ongoing external hardware and software costs}) + (\$29,166.67 \text{ to maintain the modified allocation timestamp requirement})$.

³⁵⁹⁵ See CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(iii)(C)(2)(b).

³⁵⁹⁶ $(\$409,166.67 \text{ in ongoing external hardware and software costs}) + (\$120,000 \text{ in ongoing external third party/outsourcing costs}) = \$529,166.67$ in ongoing external costs per large OATS-reporting broker-dealer.

Central Repository, for an estimated aggregate burden of 2,274,804 hours³⁵⁹⁷ and an estimated aggregate ongoing external cost of \$66,675,000.42.³⁵⁹⁸

B. Outsourcers

i. Small OATS-Reporting Broker-Dealers

As it did in the Notice, based on data provided by FINRA, the Commission estimates that there are 806 broker-dealers that report fewer than 350,000 OATS ROEs monthly. The Commission believes that these broker-dealers generally outsource their regulatory reporting obligations because during the period June 15—July 10, 2015, approximately 88.9% of their 350,000 OATS ROEs were reported through service bureaus, with 730 of these broker-dealers reporting more than 99% of their OATS ROEs through one or more service bureaus.³⁵⁹⁹ The Commission estimates that these firms currently spend an aggregate of \$100.1 million on annual outsourcing costs.³⁶⁰⁰ The Commission estimates these 806 broker-dealers would spend \$100.2 million in aggregate to outsource their regulatory data reporting to service bureaus to report in accordance with Rule 613,³⁶⁰¹ or \$124,373 per broker-dealer.³⁶⁰² These external outsourcing

³⁵⁹⁷ The Commission estimates that 126 large OATS-reporting broker-dealers would be impacted by this information collection. (126 large OATS-reporting broker-dealers) x (18,054 burden hours) = 2,274,804 aggregate ongoing burden hours.

³⁵⁹⁸ (\$409,166.67 in ongoing external hardware and software costs) + (\$120,000 in ongoing external third party/outsourcing costs) x (126 large OATS-reporting broker-dealers) = \$66,675,000.42 in aggregate ongoing external costs.

³⁵⁹⁹ See Notice, supra note 5, at 30718. Because of the extensive use of service bureaus in these categories of broker-dealers, the Commission assumes that these broker-dealers are likely to use service bureaus to accomplish their CAT data reporting.

³⁶⁰⁰ The average broker-dealer in this category reported 15,185 OATS ROEs from June 15-July 10, 2015; the median reported 1,251 OATS ROEs. Of these broker-dealers, 39 reported more than 100,000 OATS ROEs during the sample period. See Section V.F.1.c.(2)B., supra.

³⁶⁰¹ Id.

cost estimates are calculated using the information from staff discussions with service bureaus and other market participants, as applied to data provided by FINRA.³⁶⁰³

Firms that outsource their regulatory data reporting still face internal staffing burdens associated with this activity. These employees perform activities such as answering inquiries from their service bureaus, and investigating reporting exceptions. Based on conversations with market participants, the Commission estimates that these firms currently have 0.5 full-time employees devoted to these activities.³⁶⁰⁴ The Commission estimates that these firms would need to hire one additional full-time employee for one year to implement CAT reporting requirements.³⁶⁰⁵

Small OATS-reporting broker-dealers that outsource their regulatory data reporting would likely face internal staffing burdens and external costs associated with ongoing activity, such as maintaining any systems that transmit data to their service providers. Based on conversations with market participants, the Commission estimates these firms would need 0.75 FTEs on an ongoing basis to perform or monitor CAT reporting.³⁶⁰⁶

(a) Small OATS-Reporting Broker-Dealers – Initial Burden and Costs

In this Order, additionally, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second

³⁶⁰² \$124,373 = \$100,200,000 / 806 broker-dealers. This amount is the average estimated annual outsourcing cost to firms that currently report fewer than 350,000 OATS ROEs per month. Id.

³⁶⁰³ See Section V.F.1.c.(2)B., supra.

³⁶⁰⁴ Id.

³⁶⁰⁵ Id.

³⁶⁰⁶ See Section IV.F.1.c.(2)B., supra.

clock offset,³⁶⁰⁷ the Commission estimates that the initial cost to a small OATS-reporting broker-dealer to implement this requirement would be \$798.04.³⁶⁰⁸ The Commission believes that this cost would be an external hardware and software cost related to adding this functionality to servers. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by small OATS-reporting broker-dealers.

Based on this information, the Commission estimates that the average initial burden to implement the needed systems changes to capture the required information and transmit it to the Central Repository in compliance with the CAT NMS Plan for small OATS-reporting broker-dealers would be approximately 1,800 burden hours.³⁶⁰⁹ The Commission believes the burden hours would be associated with work performed by internal technology, compliance and legal staff in connection with the implementation of CAT data reporting. The Commission also now estimates that each small OATS-reporting broker-dealer would incur approximately \$125,171.04

³⁶⁰⁷ See supra note 3528.

³⁶⁰⁸ The commenter stated that this requirement would cost the industry \$44,050,000 in initial implementation costs. The commenter attributed \$1,300,000 of the implementation cost estimate to 13 service bureaus. For purposes of this Paperwork Reduction Act analysis, the Commission is assuming that the portion of the estimates attributed by the commenter to service bureaus will be passed-through to their Outsourcing broker-dealer clients that rely on service bureaus to perform their regulatory data reporting. The Commission is thus applying the portion of the commenter's cost estimates attributed to the 13 service bureaus across the 1,629 broker-dealers that are categorized as Outsourcing broker-dealers. $\$1,300,000 / 1,629$ Outsourcing broker-dealers = \$798.04 in initial costs to implement the modified allocation timestamp requirement per Outsourcing broker-dealer.

³⁶⁰⁹ This estimate assumes that, based on the expected FTE count provided, a small OATS-reporting broker-dealer would have to hire 1 new FTE for implementation. The salary attributed to the 1 FTE would be (1 FTE) x (\$424,350 FTE cost) = \$424,350 per year. To determine the number of burden hours to be incurred by the current 0.5 FTE for implementation, multiply 0.5 FTE by 1,800 hours per year = 900 initial burden hours.

in initial external costs.³⁶¹⁰ Therefore, the Commission now estimates that the average one-time initial burden per small OATS-reporting broker-dealer would be 1,800 burden hours and external costs of \$125,171.04, for an estimated aggregate initial burden of 1,450,800 hours³⁶¹¹ and an estimated aggregate initial external cost of \$100,887,858.24.³⁶¹²

(b) Small OATS-Reporting Broker-Dealers – Ongoing Burden and Costs

In this Order, the Commission estimates that it would cost, on average, approximately \$124,373 in ongoing external outsourcing costs³⁶¹³ to ensure ongoing compliance with Rule 613. Additionally, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁶¹⁴ the Commission estimates that the ongoing cost to a small OATS-reporting broker-dealer to maintain the modified allocation timestamp requirement would be \$66.50.³⁶¹⁵ The Commission

³⁶¹⁰ \$125,171.04 = (\$124,373 in initial outsourcing costs) + (\$798.04 to implement the allocation timestamp).

³⁶¹¹ The Commission estimates that 806 small OATS-reporting broker-dealers would be impacted by this information collection. (806 small OATS-reporting broker-dealers) x (1,800 burden hours) = 1,450,800 aggregate initial burden hours.

³⁶¹² (\$124,373 in initial outsourcing costs) + (\$798.04 to implement the allocation timestamp) x (806 small OATS-reporting broker-dealers) = \$100,887,858.24 in aggregate initial external costs.

³⁶¹³ See supra note 3610.

³⁶¹⁴ See supra note 3528.

³⁶¹⁵ The commenter stated that this requirement would cost the industry \$5,035,833 in ongoing costs. The commenter attributed \$108,333 of the ongoing cost estimate to 13 service bureaus. For purposes of this Paperwork Reduction Act analysis, the Commission is assuming that the portion of the estimates attributed by the commenter to service bureaus will be passed-through to their Outsourcing broker-dealer clients that rely on service bureaus to perform their regulatory data reporting. The Commission is thus applying the portion of the commenter's cost estimates attributed to the 13 service bureaus across the 1,629 broker-dealers that are categorized as Outsourcing broker-

believes that this cost would be an external hardware and software cost related to maintenance of the modified allocation timestamp. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by small OATS-reporting broker-dealers

Therefore, the Commission now estimates that the average ongoing annual burden per small OATS-reporting broker-dealer would be approximately 1,350 hours, plus \$124,439.50,³⁶¹⁶ in external costs, for an estimated aggregate ongoing burden of 1,088,100 hours³⁶¹⁷ and an estimated aggregate ongoing external cost of \$100,298,237.³⁶¹⁸

ii. Small Non-OATS-Reporting Broker-Dealers

In addition to firms that currently report to OATS, as it did in the Notice, the Commission estimates there are 799 broker-dealers that are currently exempt from OATS reporting rules due to firm size, or excluded because all of their order flow is routed to a single OATS reporter, such as a clearing firm, that would incur CAT reporting obligations.³⁶¹⁹ A further 24 broker-dealers

dealers. $\$108,333 / 1,629$ Outsourcing broker-dealers = \$66.50 in ongoing costs to maintain the modified allocation timestamp requirement per Outsourcing broker-dealer.

³⁶¹⁶ $\$124,439.50 = (\$124,373 \text{ in ongoing outsourcing costs}) + (\$66.50 \text{ to maintain the allocation timestamp})$

³⁶¹⁷ The Commission estimates that 806 small OATS-reporting broker-dealers would be impacted by this information collection. $(806 \text{ small OATS-reporting broker-dealers}) \times (1,350 \text{ burden hours}) = 1,088,100$ aggregate ongoing burden hours to ensure ongoing compliance with Rule 613.

³⁶¹⁸ $\$100,298,237 = (\$124,373 \text{ in ongoing outsourcing costs}) + (\$66.50 \text{ to maintain the allocation timestamp}) \times (806 \text{ broker-dealers})$.

³⁶¹⁹ See Section V.F.1.c.(2)B., supra. Rule 613 does not exclude from data reporting obligations SRO members that quote or execute transactions in NMS Securities and Listed Options that route to a single market participant; see also CAT NMS Plan, supra note 5, at Appendix C, Section B.7(b)(ii)(B)(2).

have SRO memberships only with one Participant;³⁶²⁰ the Commission believes this group is comprised mostly of floor brokers and further believes these firms would experience CAT implementation and ongoing reporting costs similar in magnitude to small equity broker-dealers that currently have no OATS reporting responsibilities.³⁶²¹

The Commission assumes these broker-dealers would have very low levels of CAT reporting, similar to those of the lowest activity firms that currently report to OATS. For these firms, the Commission assumes that under CAT they would incur the average estimated service bureau cost of broker-dealers that currently report fewer than 350,000 OATS ROEs per month, which is \$124,373 annually.³⁶²² Furthermore, because these firms have more limited data reporting requirements than other firms, the Commission assumes these firms currently have only 0.1 full-time employees currently dedicated to regulatory data reporting activities.³⁶²³ The Commission assumes these firms would require 2 full-time employees for one year to implement CAT.³⁶²⁴

Small non-OATS-reporting broker-dealers that outsource their regulatory data reporting would likely face internal staffing burdens and costs associated with ongoing activity, such as maintaining any systems that transmit data to their service providers. Based on conversations with market participants, the Commission estimates these firms would need 0.75 full-time employees annually to perform or monitor CAT reporting.

³⁶²⁰ See Section V.F.1.c.(2)B., supra.

³⁶²¹ Id.

³⁶²² Id.

³⁶²³ Id.

³⁶²⁴ Id.

(a) Small Non-OATS Reporting Broker-Dealers – Initial Burden and Costs

In this Order, additionally, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁶²⁵ the Commission estimates that the initial cost to a small non-OATS-reporting broker-dealer would be \$798.04.³⁶²⁶ The Commission believes that this cost would be an external hardware and software cost related to adding this functionality to servers. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by small non-OATS-reporting broker-dealers

Based on this information, the Commission now estimates that the average initial burden to develop and implement the needed systems changes to capture the required information and transmit it to the Central Repository in compliance with the Rule for small, non-OATS-reporting broker-dealers would be approximately 3,600 initial burden hours.³⁶²⁷ The Commission believes the burden hours would be associated with work performed by internal technology, compliance and legal staff in connection with the implementation of CAT Data reporting. The Commission

³⁶²⁵ See supra note 3528.

³⁶²⁶ The commenter stated that this requirement would cost the industry \$44,050,000 in initial implementation costs. The commenter attributed \$1,300,000 of the implementation cost estimate to 13 service bureaus. For purposes of this Paperwork Reduction Act analysis, the Commission is assuming that the portion of the estimates attributed by the commenter to service bureaus will be passed-through to their Outsourcing broker-dealer clients that rely on service bureaus to perform their regulatory data reporting. The Commission is thus applying the portion of the commenter's cost estimates attributed to the 13 service bureaus across the 1,629 broker-dealers that are categorized as Outsourcing broker-dealers. $\$1,300,000 / 1,629$ Outsourcing broker-dealers = \$798.04 in initial costs to implement the modified allocation timestamp requirement per Outsourcing broker-dealer.

³⁶²⁷ $3,600$ initial burden hours = (2 FTEs for implementation of CAT Data reporting systems) x (1,800 working hours per year).

also now estimates that each small non-OATS-reporting broker-dealer would incur approximately \$125,171.04 in initial external outsourcing costs.³⁶²⁸ Therefore, the Commission now estimates that the average one-time initial burden per small non-OATS-reporting broker-dealer would be 3,600 burden hours and external costs of \$125,171.04 for an estimated aggregate initial burden of 2,962,800 hours³⁶²⁹ and an estimated aggregate initial external cost of \$103,015,765.92.³⁶³⁰

(b) Small Non-OATS-Reporting Broker-Dealers – Ongoing Burden and Costs

In this Order, additionally, based on the comment that provided estimates for a modified allocation timestamp requirement, with a one second timestamp granularity and a one second clock offset,³⁶³¹ the Commission estimates that the ongoing cost to a small non-OATS-reporting broker-dealer to maintain the modified allocation timestamp requirement would be \$66.50.³⁶³²

³⁶²⁸ \$125,171.04 = (\$124,373 in initial outsourcing costs) + (\$798.04 to implement the allocation timestamp).

³⁶²⁹ The Commission estimates that 823 small non-OATS-reporting broker-dealers would be impacted by this information collection. (823 small non-OATS-reporting broker-dealers) x (3,600 burden hours) = 2,962,800 aggregate initial burden hours.

³⁶³⁰ \$103,015,765.92 = (\$124,373 in initial outsourcing costs) + (\$798.04 to implement the allocation timestamp) x (823 small non-OATS-reporting broker-dealers).

³⁶³¹ See supra note 3528.

³⁶³² The commenter stated that this requirement would cost the industry \$5,035,833 in ongoing costs. The commenter attributed \$108,333 of the ongoing cost estimate to 13 service bureaus. For purposes of this Paperwork Reduction Act analysis, the Commission is assuming that the portion of the estimates attributed by the commenter to service bureaus will be passed-through to their Outsourcing broker-dealer clients that rely on service bureaus to perform their regulatory data reporting. The Commission is thus applying the portion of the commenter's cost estimates attributed to the 13 service bureaus across the 1,629 broker-dealers that are categorized as Outsourcing broker-dealers. \$108,333 / 1,629 Outsourcing broker-dealers = \$66.50 in ongoing costs to maintain the modified allocation timestamp requirement per Outsourcing broker-dealer.

The Commission believes that this cost would be an external hardware and software cost related to maintenance of the modified allocation timestamp. The Commission is adding the cost of the modified allocation timestamp requirement to the external costs to be incurred by small non-OATS-reporting broker-dealers

Therefore, the Commission now estimates that the average ongoing annual burden per small non-OATS-reporting broker-dealer would be approximately 1,350 hours, plus \$124,439.50³⁶³³ in external costs, for an estimated aggregate ongoing burden of 1,111,050 hours³⁶³⁴ and an estimated aggregate ongoing external cost of \$102,413,708.50.³⁶³⁵

E. Summary of Collection of Information under the CAT NMS Plan, as Amended by the Commission

As noted above,³⁶³⁶ the Commission is amending the CAT NMS Plan, resulting in a new information collection requirement, “CAT NMS Plan Reporting and Disclosure Requirements.” The Commission is requesting public comment on the new collection of information requirement in this Order. The Commission is applying for an OMB control number for the proposed new collection of information in accordance with 44 U.S.C. 3507(j) and 5 CFR 1320.13, and OMB has not yet assigned a control number to the new collection. Responses to the new collection of information would be mandatory. An agency may not conduct or sponsor, and a person is not

³⁶³³ \$124,439.50 = (\$124,373 in ongoing outsourcing costs) + (\$66.50 to maintain the allocation timestamp)

³⁶³⁴ The Commission estimates that 823 small non-OATS-reporting broker-dealers would be impacted by this information collection. (823 small non-OATS-reporting broker-dealers x 1,350 burden hours) = 1,111,050 aggregate ongoing burden hours to ensure ongoing compliance with Rule 613.

³⁶³⁵ \$102,413,708.50 = (\$124,373 in ongoing outsourcing costs) + (\$66.50 to maintain the allocation timestamp) x (823 small non-OATS reporting broker-dealers).

³⁶³⁶ See Section VI.

required to respond to, a collection of information unless it displays a currently valid OMB control number.

1. One-Time Reports

a. Independent Audit of Expenses Incurred Prior to the Effective Date

Section 6.6(a)(i) of the CAT NMS Plan requires the Participants to provide to the Commission, and make public, an independent audit of fees, costs and expenses incurred by the Participants on behalf of the Company, prior to the Effective Date, in connection with the creation and implementation of the CAT, at least one month prior to submitting any rule filing to establish initial fees to the Commission.

b. Review of Clock Synchronization Standards

Section 6.6(a)(ii) of the CAT NMS Plan now requires a written assessment of clock synchronization standards, including consideration of industry standards based on the type of CAT Reporter, Industry Member and type of system, within six months of effectiveness of the Plan.

c. Coordinated Surveillance Report

Section 6.6(a)(iii) of the CAT NMS Plan requires the Participants to submit a written report detailing the Participants' consideration of coordinated surveillance (e.g., entering into a Rule 17d-2 agreements or regulatory services agreements), within 12 months of effectiveness of the Plan.

d. Assessment of Industry Member Bulk Access to Reported Data

Section 6.6(a)(iv) of the CAT NMS Plan requires the Participants to provide a written report discussing the feasibility, benefits, and risks of allowing an Industry Member to bulk

download the Raw Data it submitted to the Central Repository, within 24 months of effectiveness of the Plan.

e. Assessment of Errors in Customer Information Fields

Section 6.6(a)(v) of the CAT NMS Plan requires the Participants to submit a written assessment of the nature and extent of errors in the Customer information submitted to the Central Repository and whether to prioritize the correction of certain data fields over others, within 36 months of effectiveness of the Plan.

f. Report on Impact of Tiered Fees on Market Liquidity

Section 6.6(a)(vi) of the CAT NMS Plan now requires the Participants to submit a written report to study the impact of tiered-fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity, within 36 months of effectiveness of the Plan.

g. Assessment of Material Systems Change on Error Rate

Section 6.6(a)(vii) of the CAT NMS Plan requires a written assessment of the projected impact of any Material Systems Change on the Maximum Error Rate, prior to the implementation of any Material Systems Change.

2. Non-Report Commission-Created Information Collections

a. Financial Statements

Section 9.2 of the CAT NMS Plan now requires that the CAT LLC financials be (i) in compliance with GAAP, (ii) be audited by an independent public accounting firm, and (iii) be made publicly available.

b. Background Checks

Section 6.1(g) of the CAT NMS Plan now requires each Participant to conduct background checks of its employees and contractors that will use the CAT System.

F. Proposed Use of Information under the CAT NMS Plan, as Amended by the Commission

1. Independent Audit of Expenses Incurred Prior to the Effective Date

Section 6.6(a)(i) of the CAT NMS Plan requires the Participants to provide to the Commission, and make public, an independent audit of fees, costs and expenses incurred by the Participants on behalf of the Company, prior to the Effective Date, in connection with the creation and implementation of the CAT, at least one month prior to submitting any rule filing to establish initial fees to the Commission. The Commission notes that any such filing will be published for notice and comment, and that such an audit would facilitate public comment and the Commission's review of these filings to ensure the fees imposed on Industry Members are reasonable, equitable and not unfairly discriminatory.

2. Review of Clock Synchronization Standards

Section 6.6(a)(ii) of the CAT NMS Plan now requires a written assessment of clock synchronization standards, including consideration of industry standards based on the type of CAT Reporter, Industry Member and type of system. The Commission believes that the Participants should consider the Plan's clock synchronization standards based on the diversity of the CAT Reporter, Industry Member, and type of system promptly and propose any appropriate amendments for Commission consideration, within six months of effectiveness of the Plan.

3. Coordinated Surveillance Report

Section 6.6(a)(iii) of the CAT NMS Plan now requires the Participants to submit a written report detailing the Participants' consideration of coordinated surveillance (e.g., entering into a Rule 17d-2 agreements or regulatory services agreements), within 12 months of effectiveness of the Plan. The Commission notes that the CAT will allow regulators to conduct cross-market surveillances and to review conduct that occurs across the markets. As a result, the

Commission believes that it may be efficient for the Participants to coordinate to conduct cross market surveillances.

4. Assessment of Industry Member Bulk Access to Reported Data

Section 6.6(a)(iv) of the CAT NMS Plan now requires the Participants to provide a written report discussing the feasibility, benefits and risks of allowing an Industry Member to bulk download the Raw Data it submitted to the Central Repository, within 24 months of effectiveness of the Plan. Commenters' expressed a desire for bulk access to their own data for surveillance and internal compliance purposes, as well as possible error correction purposes. While the Participants did not permit such access in the Plan citing security and cost concerns, they did represent that they would consider allowing bulk access to the audit trail data reported by Industry Members once CAT is operational. The Commission believes a report discussing the feasibility of this type of access will ensure the Participants consider the issue and are responsive to Industry requests.

5. Assessment of Errors in Customer Information Fields

Section 6.6(a)(v) of the CAT NMS Plan requires the Participants to submit a written assessment of the nature and extent of errors in the Customer information submitted to the Central Repository and whether the correction of certain data fields should be prioritized. The Commission believes that requiring such an assessment of errors could help ensure that the accuracy of CAT Data is achieved in the most prompt and efficient manner.

6. Report on Impact of Tiered Fees on Market Liquidity

Section 6.6(a)(vi) of the CAT NMS Plan now requires the Participants to submit a written report to study the impact of tiered-fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity, within 36 months of

effectiveness of the Plan. One commenter expressed concern that use of a tiered-fees structure could discourage the display of quotes. In response the Participants explained that one of the reasons they chose to use a tiered-fee funding model was to limit disincentives to providing liquidity. To help determine whether the Plan's funding model actually achieves the Participants' stated objective, the Commission believes it is appropriate to require them to provide this assessment. The Commission believes that a report that explains the observed impact on liquidity after reporting begins will allow the Commission and the Participants to determine whether or not the tier-fee structure discourages Industry Member from providing liquidity.

7. Assessment of Material Systems Change on Error Rate

The Commission is amending the Plan to require Participants to provide the Commission a written assessment of the projected impact of any Material Systems Change on the Maximum Error Rate, prior to the implementation of any Material Systems Change. The Commission believes that Material Systems Changes either could result in new challenges for CAT Reporters or simplify the means for reporting data. In either case, the appropriateness of the Maximum Error Rate could be impacted, and thus warrant a change. Accordingly, the Commission believes it appropriate to require the Participants to provide the Commission an assessment of the projected impact on the Maximum Error Rate, including any recommended changes thereto, prior to the implementation of any Material Systems Change.

8. Financial Statements

Section 9.2 of the CAT NMS Plan now requires that the CAT LLC financials be (i) in compliance with GAAP, (ii) be audited by an independent public accounting firm, and (iii) be

made publicly available. The Commission believes that this requirement will promote greater transparency with respect to the Company's financial accounting.

9. Background Checks

Section 6.1(g) of the CAT NMS Plan now requires each Participant to conduct background checks of its employees and contractors that will use the CAT System. The Commission believes that such a requirement generally should extend to Participants with respect to all of their users that have access to CAT Data and therefore has amended the Plan to require that each Participant conduct background checks for its employees and contractors that will use the CAT System. The Commission believes that this amendment to the Plan is appropriate in order to better manage the risk of bad actors accessing to the CAT System.

G. Total Initial and Annual Reporting and Recordkeeping Burden of Information Collection under the CAT NMS Plan, as Amended by the Commission

1. Burden on National Securities Exchanges and National Securities Associations

a. Independent Audit of Expenses Incurred Prior to the Effective Date

Section 6.6(a)(i) of the CAT NMS Plan now requires the Participants to provide to the Commission an independent audit of fees, costs and expenses incurred by the Participants on behalf of the Company, prior to the Effective Date, in connection with the creation and implementation of the CAT, at least one month prior to submitting any rule filing to establish initial fees to the Commission.

The Commission preliminarily estimates that each Participant would incur an initial, one-time external cost of the audit of \$238.09.³⁶³⁷ The Commission preliminarily estimates that the aggregate initial, one-time external cost of the audit is \$5,000.³⁶³⁸

b. Review of Clock Synchronization Standards

Section 6.6(a)(ii) of the CAT NMS Plan now requires a written assessment of clock synchronization standards, including consideration of industry standards based on the type of CAT Reporter, Industry Member and type of system, within six months of effectiveness of the Plan.

The Commission preliminarily estimates that it would take each Participant approximately 19 initial, one-time burden hours of internal legal and information technology staff time to prepare and submit the assessment of clock synchronization standards.³⁶³⁹ The Commission believes that this burden would mostly be comprised of information technology staff time to conduct the assessment, with less time allocated to internal legal staff for review of the assessment. Additionally, the Commission now preliminarily estimates that on average, each Participant would outsource 0.5 hours of legal time to assist in the review of the assessment, for an initial, one-time external cost of approximately \$200.³⁶⁴⁰ Therefore, the Commission

³⁶³⁷ The Commission estimates that the cost of the audit would be an aggregate, external cost of \$5,000. $\$5,000 / 21 \text{ Participants} = \$238.09 \text{ per Participant}$. See Section V.F.1.b., supra.

³⁶³⁸ Id.

³⁶³⁹ The Commission estimates that 19 internal burden hours = (Computer Operations Department Manager at 5 hours) + (Senior Systems Analyst at 5 hours) + (Systems Analyst at 5 hours) + (Attorney at 2 hours) + (Assistant General Counsel at 2 hours).

³⁶⁴⁰ $\$200 = (\$400 \text{ per hour rate for outside legal services}) \times (0.5 \text{ hours})$. The Commission based this estimate on the assumption that the assessment would require approximately one-fifth the effort of review by outside counsel as the document required by Rule 613(i)

preliminarily estimates that the initial, one-time burden of preparing and submitting the assessment would be 19 initial, one-time burden hours per Participant plus \$200 of external costs for outsourced legal counsel per Participant, for an estimated aggregate initial, one-time burden of approximately 399 hours³⁶⁴¹ and an estimated aggregate initial, one-time external cost of \$4,200.³⁶⁴²

c. Coordinated Surveillance Report

Section 6.6(a)(iii) of the CAT NMS Plan now requires the Participants to submit a written report detailing the Participants' consideration of coordinated surveillance (e.g., entering into Rule 17d-2 agreements or regulatory services agreements), within 12 months of effectiveness of the Plan.

The Commission preliminarily estimates that it would take each Participant approximately 85.71 initial burden hours of internal legal, compliance, business operations, and information technology staff time to prepare and submit the report.³⁶⁴³ The Commission

regarding the expansion of the CAT to other securities because the Commission believes the assessment is not as comprehensive as the expansion document since it is limited to clock synchronization standards. See Section VI.D.1.e., supra.

³⁶⁴¹ 399 initial internal burden hours = (19 initial, one-time burden hours) x (21 Participants).

³⁶⁴² \$4,200 = (21 Participants) x (\$400 per hour rate for outside legal services) x (0.5 hours).

³⁶⁴³ The Commission calculates the total estimated burden hours based on a similar formulation used for calculating the total estimated burden hours of Rule 613(i)'s requirement for a document addressing expansion of the CAT to other securities. See Section VI.D.1.e., supra. The Commission assumes that the preparation of the report would be approximately one-half as burdensome as the document required by Rule 613(i). Because the Commission believes that the report would be half as burdensome as the document required by Rule 613(i), the Commission believes that all of the Participants would need 1 FTE for the report. (1 FTE) x (1,800 working hours per year) = 1,800 initial, one-time burden hours per year for all of the Participants. (1,800 burden hours per year) / (21 Participants) = 85.71 initial, one-time burden hours per Participant for preparation and submission of the report.

preliminarily estimates that on average, each Participant would outsource 2.5 hours of legal time to assist in the drafting and review of the report, for an initial, one-time external cost of approximately \$1,000.³⁶⁴⁴ Therefore, the Commission preliminarily estimates that the initial, one-time burden of preparing and submitting the report would be 85.71 initial, one-time burden hours per Participant plus \$1,000 of external costs for outsourced legal counsel per Participant, for an estimated aggregate initial, one-time burden of 1,799.91 hours³⁶⁴⁵ and an estimated aggregate initial, one-time external cost of \$21,000.³⁶⁴⁶

d. Assessment of Industry Member Bulk Access to Reported Data

Section 6.6(a)(iv) of the CAT NMS Plan requires the Participants to provide a written report discussing the feasibility, benefits, and risks of allowing an Industry Member to bulk download the Raw Data it submitted to the Central Repository, within 24 months of effectiveness of the Plan.

The Commission preliminarily estimates that it would take each Participant approximately 15 initial, one-time burden hours of internal legal, compliance, business operations, and information technology staff time to prepare and submit the assessment.³⁶⁴⁷ The

³⁶⁴⁴ \$1,000 = (\$400 per hour rate for outside legal services) x (2.5 hours). The Commission based this estimate on the assumption that the report would require approximately one-tenth the effort of drafting by outside counsel as the document required by Rule 613(i) regarding the expansion of the CAT to other securities. See Section VI.D.1.e., *supra*.

³⁶⁴⁵ 1,799.91 initial, one-time burden hours = (85.71 initial, one-time burden hours) x (21 Participants).

³⁶⁴⁶ \$21,000 = (21 Participants) x (\$400 per hour rate for outside legal services) x (2.5 hours).

³⁶⁴⁷ The Commission estimates that 15 internal burden hours = (Computer Operations Department Manager at 2 hours) + (Senior Database Administrator at 5 hours) + (Senior Systems Analyst at 2 hours) + (Systems Analyst at 2 hours) + (Attorney at 2 hours) + (Assistant General Counsel at 2 hours).

Commission preliminarily estimates that on average, each Participant would outsource five hours of legal time to assist in the preparation and review of the assessment, for an initial, one-time external cost of approximately \$2,000.³⁶⁴⁸ Therefore, the Commission preliminarily estimates that the initial one-time burden of submitting a written assessment would be 15 initial burden hours per SRO plus \$2,000 of external costs for outsourced legal counsel per Participant, for an estimated aggregate initial burden of approximately 315 hours³⁶⁴⁹ and an estimated aggregate initial external cost of \$42,000.³⁶⁵⁰

e. Assessment of Errors in Customer Information Fields

Section 6.6(a)(v) of the CAT NMS Plan requires the Participants to submit a written assessment of errors in the customer information submitted to the Central Repository and whether to prioritize the correction of certain data fields over others, within 36 months of effectiveness of the Plan.

The Commission preliminarily estimates that it would take each Participant approximately 24 initial, one-time burden hours of internal legal, compliance, and information technology staff time to prepare and submit the assessment of errors.³⁶⁵¹ The Commission

³⁶⁴⁸ \$2,000 = (\$400 per hour rate for outside legal services) x (5 hours). The Commission is basing this estimate on the assumption that the assessment would require approximately twice the effort of drafting by outside counsel as the document required by Rule 613(i) regarding the expansion of the CAT to other securities. The Commission attributes this difference to ensuring that any potential security issues regarding industry bulk access of data are sufficiently reviewed and addressed. See Section VI.D.1.e., supra.

³⁶⁴⁹ 315 initial one-time internal burden hours = (15 initial, one-time burden hours per Participant) x (21 Participants).

³⁶⁵⁰ \$42,000 = (21 Participants) x (\$400 per hour rate for outside legal services) x (5 hours).

³⁶⁵¹ The Commission estimates that 24 internal burden hours = (Computer Operations Department Manager at 3 hours) + (Senior Database Administrator at 4 hours) + (Senior

estimates that on average, each Participant would outsource 1.25 hours of legal time to assist in the review of the assessment, for an initial, one-time external cost of approximately \$500.³⁶⁵² Therefore, the Commission now preliminarily estimates that the initial, one-time burden of preparing and submitting a written assessment would be 24 initial, one-time burden hours per SRO plus \$500 of external costs for outsourced legal counsel per Participant, for an estimated aggregate initial, one-time burden of approximately 504 hours³⁶⁵³ and an estimated aggregate initial, one-time external cost of \$10,500.³⁶⁵⁴

f. Report on Impact of Tiered Fees on Market Liquidity

Section 6.6(a)(vi) of the CAT NMS Plan now requires the Participants to submit a written report to study the impact of tiered-fees on market liquidity, including an analysis of the impact of the tiered-fee structure on Industry Members' provision of liquidity, within 36 months of effectiveness of the Plan.

Systems Analyst at 2 hours) + (Systems Analyst at 2 hours) + (Compliance Attorney at 5 hours) + (Attorney at 4 hours) + (Assistant General Counsel at 4 hours).

³⁶⁵² The Commission calculated the total estimated external cost based on the revised burden hour estimate for the written assessment of the operation of the CAT. See Section VI.D.1.f.b, *supra*. The Commission assumes that the preparation and submission of the error assessment would cost approximately half as much as the revised written assessment. The revised written assessment estimate provides that each Participant would outsource 2.5 hours of legal time to assist in the review of the assessment, for an external cost of approximately \$1,000. The Commission estimates that each Participant would outsource approximately 1.25 hours of legal time, for an initial, one-time external cost of \$500 (1.25 hours x \$400 per hour rate for outside legal services) to assist in drafting the error assessment.

³⁶⁵³ 504 initial, one-time burden hours = (24 initial, one-time burden hours per Participant) x (21 Participants).

³⁶⁵⁴ \$10,500 = (21 Participants) x (\$400 per hour rate for outside legal services) x (1.25 hours).

The Commission preliminarily estimates that it would take each Participant approximately 21.43 initial, one-time burden hours of internal legal and business operations staff time to prepare and submit the report studying the impact of tiered fees on market liquidity.³⁶⁵⁵ The Commission also preliminarily estimates that on average, each Participant would outsource 0.5 hours of legal time to assist in drafting the report, for an initial, one-time external cost of approximately \$200.³⁶⁵⁶ Therefore, the Commission now preliminarily estimates that the initial, one-time burden of preparing and submitting the report studying the impact of tiered fees on market liquidity would be 21.43 initial, one-time burden hours per Participant plus \$200 of external costs for outsourced legal counsel per Participant, for an estimated aggregate initial,

³⁶⁵⁵ The Commission calculated the total estimated burden hours based on a similar formulation used for calculating the total estimated burden hours of Rule 613(i)'s requirement for a document addressing expansion of the CAT to other securities. See Section VI.D.1.e., *supra*. The Commission assumes that the preparation of the assessment would be approximately one-eighth as burdensome as the document required by Rule 613(i). As noted in note 3394, to estimate the Rule 613(i) burden, the Commission is applying the internal burden estimate provided in the CAT NMS Plan for Plan development over a 6-month period, and dividing the result in half. See CAT NMS Plan, *supra* note 5, at Appendix C, Section B.7(b)(iii). 0.667 FTEs required for all Participants per month to develop the CAT NMS Plan = (20 FTEs / 30 months). 0.667 FTEs x 6 months = 4 FTEs. 4 FTEs / 2 = 2 FTEs needed for all of the Participants to create and submit the Rule 613(i) document. (2 FTEs) x (1/8) = 0.25 FTE to prepare and submit the report studying the impact of tiered fees on market liquidity. (0.25 FTE x 1,800 working hours per year) = 450 initial, one-time burden hours for all of the Participants to review and comment on the written assessment. (450 burden hours / 21 Participants) = 21.43 initial, one-time burden hours per Participant to prepare and submit the report.

³⁶⁵⁶ \$200 = (\$400 per hour rate for outside legal services) x (0.5 hours).

one-time burden of approximately 450 hours³⁶⁵⁷ and an estimated aggregate initial, one-time external cost of \$4,200.³⁶⁵⁸

g. Assessment of Material Systems Change on Error Rate

Section 6.6(a)(vii) of the CAT NMS Plan requires a written assessment of the projected impact of any Material Systems Change on the Maximum Error Rate, prior to the implementation of any Material Systems Change.

The Commission preliminarily estimates that the CAT may have four Material Systems Changes per year. Based on this estimate, the Commission preliminarily estimates that each Participant would incur 5.95³⁶⁵⁹ burden hours to prepare and submit each assessment, or 23.8 annual burden hours per year,³⁶⁶⁰ for an aggregate, ongoing estimate of 125 burden hours per report,³⁶⁶¹ or an aggregate ongoing estimate of 500 burden hours per year.³⁶⁶²

³⁶⁵⁷ 450 initial, one-time burden hours = (21.43 initial, one-time burden hours) x (21 Participants).

³⁶⁵⁸ \$4,200 = (21 Participants) x (\$400 per hour rate for outside legal services) x (0.5 hours).

³⁶⁵⁹ This estimate is based on the quarterly material system change reports required under Rule 1003(a)(1) of Regulation SCI. The Commission estimated that each SCI entity would incur a burden of 125 hours to comply with the quarterly report on material changes to SCI systems required under Rule 1003(a)(1) (7.5 hours by an Attorney, 7.5 hours by a Compliance Manager, 5 hours by a Chief Compliance Officer, 30 hours by a Senior Business Analyst, and 75 hours by a Senior Systems Analyst). See Regulation Systems Compliance and Integrity, Securities Exchange Act Release No. 73639 (December 5, 2014), 79 FR 72251, at 72390, n.1656. Because the CAT is an SCI System of the Participants, the Commission is assuming for its estimates that each Participant would incur an equal portion of the 125 burden hours per report.

³⁶⁶⁰ The Commission estimates that there would be four Material System Changes per year. 5.95 burden hours per report x 4 reports per year = 23.8 annual burden hours per year.

³⁶⁶¹ (5.95 burden hours per report) x 21 Participants = 125 burden hours per report.

³⁶⁶² (125 burden hours) x (4 reports per year) = 500 annual burden hours.

h. Financial Statements

Section 9.2 of the CAT NMS Plan now requires that the CAT LLC financials be (i) in compliance with GAAP, (ii) be audited by an independent public accounting firm, and (iii) be made publicly available. The Commission preliminarily estimates that each Participant would incur an annual external cost of \$3,095.24³⁶⁶³ associated with this requirement, for an aggregate annual, ongoing external cost of \$65,000 to the Participants.³⁶⁶⁴

i. Background Checks

Section 6.1(g) of the CAT NMS Plan now requires each Participant to conduct background checks of its employees and contractors that will use the CAT System.³⁶⁶⁵ The Commission preliminarily estimates that this requirement will impact approximately 1,500 users.³⁶⁶⁶ The Commission preliminarily estimates that each Participant would need to have background checks of approximately 71 users.³⁶⁶⁷ For its estimates, the Commission is assuming that these would be background checks using fingerprints submitted to the Attorney

³⁶⁶³ $(\$65,000 \text{ annual, external cost}) / (21 \text{ Participants}) = \$3,095.24 \text{ per Participant. See supra note 2503 (explaining the source of the } \$65,000 \text{ estimate, stating that the Commission drew this estimate from a recent Commission adopting release and an industry report); see also Section V.F.1.b., supra.}$

³⁶⁶⁴ See supra note 2503 (explaining the source of the \$65,000 estimate); see also Section V.F.1.b., supra.

³⁶⁶⁵ The Commission notes that Section 17(f)(2) of the Exchange Act already mandates that each national securities exchange and national securities association require each of its partners, directors, officers and employees be fingerprinted and such fingerprints to be submitted to the Attorney General of the United States for identification and appropriate processing. 15 U.S.C. 78q(f)(2).

³⁶⁶⁶ This number is based on conversations with Participants.

³⁶⁶⁷ $71.42 \text{ users per Participant} = (1,500 \text{ users}) / (21 \text{ Participants}).$

General of the United States for identification and processing.³⁶⁶⁸ The Commission preliminarily estimates that it would take approximately 15 minutes³⁶⁶⁹ to create and submit each fingerprint card.³⁶⁷⁰ The total reporting burden per Participant is therefore preliminarily estimated to be 17.75 initial, one-time burden hours,³⁶⁷¹ for an aggregate, initial burden of 374.01 hours.³⁶⁷² The Commission preliminarily estimates that the total initial external cost per Participant would be \$2,603.04,³⁶⁷³ for an aggregate, initial external cost of \$54,987.45.³⁶⁷⁴

The Commission preliminarily estimates that the ongoing internal burden hours for each Participant would be approximately 4.26 annual burden hours,³⁶⁷⁵ for an aggregate annual

³⁶⁶⁸ The Commission is basing this assumption on the requirements of Section 17(f)(2). 15 U.S.C. 78q(f)(2).

³⁶⁶⁹ This is based on the per respondent burden in Extension of Rule 17f-2, SEC File No. 270-35, OMB Control No. 3235-0029, 79 FR 42563 (July 22, 2014).

³⁶⁷⁰ The Commission is assuming that this would be a burden of 15 minutes for a Compliance Manager per fingerprint card.

³⁶⁷¹ $17.81 \text{ burden hours} = (\text{Compliance Manager at 15 minutes}) \times (71.42 \text{ users}).$

³⁶⁷² $374.01 = (17.75 \text{ initial one-time burden hours}) \times (21 \text{ Participants}).$

³⁶⁷³ $71.42 \times 45\% \text{ hard copy fingerprinting} = 32.14 \text{ users. } 71 \times 55\% \text{ electronic fingerprinting} = 39.28 \text{ users. } (32.14 \text{ hard copy fingerprinting users}) \times (\$44.50 \text{ per hard copy fingerprint}) = \$1,430.23 \text{ for hard copy fingerprinting users per Participant. } (39.28 \text{ electronic fingerprinting users}) \times (\$30.25 \text{ per electronic fingerprint}) = \$1,188.22 \text{ for electronic fingerprint users per Participant. } \$1,430.23 + \$1,188.22 = \$2,618.45 \text{ per Participant in initial external costs for fingerprinting.}$

³⁶⁷⁴ $\$54,987.45 = (\$2,618.45 \text{ per Participant}) \times (21 \text{ Participants}).$

³⁶⁷⁵ The Commission assumes that the finance industry has a rate of 23.87% turnover per year, based on a monthly rate for both employment separations and hires of 1.8% for the finance and insurance industry in September 2016. See <http://www.bls.gov/news.release/pdf/jolts.pdf> (news release from the Bureau of Labor Statistics, dated November 8, 2016). The Commission preliminarily estimates that the Participants will have to annually conduct background checks of 23.87% of the 1,500 users, or 358.05 users per year. $(358.05 \text{ users}) / (21 \text{ Participants}) = 17.05 \text{ users}$ that will need to be subject to background checks on an annual basis. Based on this estimate, the

burden hour amount of 89.51 burden hours.³⁶⁷⁶ The Commission also preliminarily estimates that the ongoing external cost to be incurred by each Participant would be approximately \$625.07,³⁶⁷⁷ for an aggregate annual external cost of \$13,126.37.³⁶⁷⁸

2. Request for Comment

Pursuant to 44 U.S.C. 3506(c)(2)(A), the Commission solicits comments on the “CAT NMS Plan Reporting and Disclosure Requirements” collection of information to:

- (1) Evaluate whether the proposed collection is necessary for the proper performance of our functions, including whether the information shall have practical utility;
- (2) Evaluate the accuracy of our estimate of the burden of the collection of information;
- (3) Determine whether there are ways to enhance the quality, utility, and clarity of the information to be collected; and

Commission estimates that each Participant would incur a burden of 4.26 ongoing annual burden hours = (Compliance Manager at 15 minutes) x (17.05 users).

³⁶⁷⁶ 89.51 annual ongoing burden hours = (4.26 ongoing annual burden hours per Participant) x (21 Participants).

³⁶⁷⁷ See supra note 3675. Based on the Commission’s estimate that 17.05 users will need to be subject to background checks annually, the Commission estimates that 45% of the 17.05 users would submit hard copy fingerprints and 55% of the 17.05 users would submit electronic fingerprints to conduct their background checks. 45% of 17.05 = 7.67 users that would submit hard copy fingerprints. 55% of 17.05 = 9.38 users that would submit electronic fingerprints. (7.67 hard copy fingerprinting users) x (\$44.50 per hard copy fingerprint) = \$341.32 for hard copy fingerprinting users per Participant. (9.38 electronic fingerprinting users) x (\$30.25 per electronic fingerprint) = \$283.75 for electronic fingerprint users per Participant. \$341.32 + \$283.75 = \$625.07 per Participant in initial external costs for fingerprinting.

³⁶⁷⁸ (\$625.07 per Participant in annual, ongoing external costs) x (21 Participants) = \$13,126.37 to conduct a fingerprint-based background check of the users.

(4) Evaluate whether there are ways to minimize the burden of the collection of information on those who are to respond, including through the use of automated collection techniques or other forms of information technology.

Persons submitting comments on the collection of information requirement should direct them to the Office of Management and Budget, Attention: Desk Officer for the Securities and Exchange Commission, Office of Information and Regulatory Affairs, Washington, DC 20503, and should also send a copy of their comments to Brent J. Fields, Secretary, Securities and Exchange Commission, 100 F Street NE, Washington, DC 20549-1090, with reference to File No. S7-11-10. Requests for materials submitted to OMB by the Commission with regard to the collection of information should be in writing, with reference to File No. S7-11-10, and be submitted to the Securities and Exchange Commission, Office of FOIA/PA Services, 100 F Street, NE, Washington, DC 20549-2736. As OMB is required to make a decision concerning the collection of information between 30 and 60 days after publication in the Federal Register, a comment to OMB is best assured of having its full effect if OMB receives it within 30 days of publication.

H. Collection of Information is Mandatory

Each collection of information discussed above would be a mandatory collection of information.

I. Confidentiality

Rule 613 requires that the information to be collected and electronically provided to the Central Repository would only be available to the national securities exchanges, national securities association, and the Commission for the purpose of performing their respective regulatory and oversight responsibilities pursuant to the federal securities laws, rules and regulations. Further, the CAT NMS Plan is required to include policies and procedures to ensure

the security and confidentiality of all information submitted to the Central Repository, and to ensure that all SROs and their employees, as well as all employees of the Central Repository, shall use appropriate safeguards to ensure the confidentiality of such data. The Commission will receive confidential information. To the extent that the Commission does receive confidential information pursuant to this collection of information, such information will be kept confidential, subject to the provisions of applicable law.

J. Recordkeeping Requirements

National securities exchanges and national securities associations would be required to retain records and information pursuant to Rule 17a-1 under the Exchange Act.³⁶⁷⁹ Broker-dealers would be required to retain records and information in accordance with Rule 17a-4 under the Exchange Act.³⁶⁸⁰ The Plan Processor would be required to retain the information reported to Rule 613(c)(7) and (e)(6) for a period of not less than five years.³⁶⁸¹

³⁶⁷⁹ 17 CFR 240.17a-1.

³⁶⁸⁰ 17 CFR 240.17a-4.

³⁶⁸¹ 17 CFR 242.613(c)(7) and (e)(6).

VII. Conclusion

For the reasons discussed above, the Commission finds that the CAT NMS Plan as amended is necessary or appropriate in the public interest, for the protection of investors and the maintenance of fair and orderly markets, to remove impediments to, and perfect the mechanism of, a national market system, or otherwise in furtherance of the purposes of the Act.

IT IS THEREFORE ORDERED, that pursuant to Section 11A of the Act, and the rules and regulations thereunder, that the CAT NMS Plan (File No. 4-698), as modified, be and it hereby is approved and declared effective, and the Participants are authorized to act jointly to implement the CAT NMS Plan as a means of facilitating a national market system.

By the Commission.

Brent J. Fields
Secretary