Hope M. Jarkowski
General Counsel
New York Stock Exchange
11 Wall Street
New York, NY 10005
T: 202.661.8946
Hope.Jarkowski@nyse.com

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By Email

Ms. Vanessa Countryman
Secretary
U.S. Securities and Exchange Commission
100 F Street NE
Washington, D.C. 20549

Re: Twenty-Third Amendment to the National Market System Plan to Address Extraordinary Market Volatility (File No. 4-631)

Dear Ms. Countryman:

NYSE Group, Inc., on behalf of the parties to the Plan to Address Extraordinary Market Volatility Pursuant to Rule 608 of Regulation NMS under the Securities Exchange Act of 1934 (the "Limit-Up/Limit-Down Plan" or "Plan"),[1] hereby files the amended Plan with the Securities and Exchange Commission (the "Commission" or "SEC") for approval pursuant to Rule 608 of Regulation NMS ("Rule 608") under the Securities Exchange Act of 1934 ("Exchange Act").[2]

The Participants initially filed the Plan with the Commission on April 5, 2011, which was published for notice and comment.[3] On May 24, 2012, the Participants filed an amendment to the Plan and the Plan, as amended, was approved by the Commission on May 31, 2012 on a pilot basis.[4] The Participants filed a second amendment to the Plan, which was immediately effective on January 23, 2013.[5] On February 19, 2013, the Participants filed a third amendment to the Plan, which the Commission approved on April 3, 2013.[6] The Participants filed a fourth amendment to the Plan, which was immediately effective on July 18, 2013.[7] On July 18, 2013, the Participants filed a fifth

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1 The current parties to the Plan are: Cboe BZX Exchange, Inc.; Cboe BYX Exchange, Inc.; Cboe EDGA Exchange, Inc.; Cboe EDGX Exchange, Inc.; Financial Industry Regulatory Authority, Inc.; Investors Exchange LLC; Long-Term Stock Exchange, Inc.; MEMX LLC; MIAX Pearl, LLC; Nasdaq BX, Inc.; Nasdaq PHLX LLC; The Nasdaq Stock Market LLC; New York Stock Exchange LLC; NYSE American LLC; NYSE Arca, Inc.; NYSE Chicago, Inc.; and NYSE National, Inc. (collectively, the "Participants").

2 17 CFR 242.608.

3 See Securities Exchange Act Release No. 64547 (May 25, 2011), 76 FR 31647 (June 1, 2011) (File No. 4-631) ("LULD Proposal").

4 See Securities Exchange Act Release No. 67091 (May 31, 2012), 77 FR 33498 (June 6, 2012) (File No. 4-631) ("Approval Order").

5 See Securities Exchange Act Release No. 68953 (February 20, 2013), 78 FR 13113 (February 26, 2013) (File No. 4-631).

6 See Securities Exchange Act Release No. 69287 (April 3, 2013), 78 FR 21483 (April 10, 2013) (File No. 4-631).

7 See Securities Exchange Act Release No. 70273 (August 27, 2013), 78 FR 54321 (September 3, 2013) (File No. 4-631) (amending Section VIII.B of the Plan to establish a new implementation schedule for Phase II of the Plan).

amendment to the Plan, which the Commission approved on September 26, 2013.[8] The Participants filed a sixth amendment to the Plan, which was immediately effective on December 3, 2013.[9] On February 24, 2014, the Participants filed a seventh amendment to the Plan, which the Commission approved on April 3, 2014.[10] On December 24, 2014, the Participants filed an eighth amendment to the Plan, which the Commission approved on February 19, 2015.[11] On July 31, 2015, the Participants filed a ninth amendment to the Plan to extend the pilot through April 22, 2016, and remove Chicago Board Options Exchange, Inc. as a Plan Participant, which the Commission approved on October 22, 2015.[12] On February 19, 2016, the Participants filed a tenth amendment to the Plan to extend the pilot through April 21, 2017 and make one modification to the Plan, which the Commission approved on April 21, 2016.[13] On August 11, 2016 the Participants filed an eleventh amendment to the Plan to add IEX as a Participant to the Plan.[14]

On September 19, 2016, the Participants filed a twelfth amendment to the Plan, which the Commission approved on January 19, 2017.[15] On February 13, 2017, the Participants filed a thirteenth amendment to the Plan to extend the pilot through April 16, 2018, among other changes, which the Commission approved on April 13, 2017.[16] On April 13, 2017, the Participants filed a fourteenth amendment to the Plan, which was immediately effective.[17] On August 31, 2017, the Participants filed a fifteenth amendment to the Plan, which was immediately effective and which extended the implementation date for the changes described in the twelfth and thirteenth Amendments.[18] On February 14, 2018, the Participants filed a sixteenth amendment to the Plan,

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8 See Securities Exchange Act Release No. 70530 (September, 26, 2013), 78 FR 60937 (October 2, 2013) (File No. 4-631).

9 See Securities Exchange Act Release No. 71247 (January 7, 2014), 79 FR 2204 (January 13, 2014) (File No. 4-631) (amending Section VIII.B of the Plan to establish a new implementation schedule for Phase II of the Plan).

10 See Securities Exchange Act Release No. 71851 (April 3, 2014), 79 FR 19687 (April 9, 2014) (File No. 4-631).

11 See Securities Exchange Act Release No. 74323 (February 19, 2015), 80 FR 10169 (February 25, 2015) (File No. 4-631).

12 See Securities Exchange Act Release No. 76244 (October 22, 2015), 80 FR 66099 (October 28, 2015) (File No. 4-631).

13 See Securities Exchange Act Release No. 77679 (April 21, 2016), 81 FR 24908 (April 27, 2016) (File No. 4-631).

14 See Securities Exchange Act Release No. 78703 (August 26, 2016), 81 FR 60397 (September 1, 2016) (File No. 4-631).

15 See Securities Exchange Act Release No. 79845 (January 19, 2017), 82 FR 8551 (January 26, 2017) (File No. 4-631).

16 See Securities Exchange Act Release No. 80455 (April 13, 2017), 82 FR 18519 (April 19, 2017) (File No. 4-631).

17 See Securities Exchange Act Release No. 80549 (April 28, 2017), 82 FR 20928 (May 4, 2017) (File No. 4-631).

18 See Securities Exchange Act Release No. 81720 (September 26, 2017), 82 FR 45922 (October 2, 2017) (File No. 4-631).

which was immediately effective.[19] On February 23, 2018, the Participants filed a seventeenth amendment to the Plan to extend the pilot through April 15, 2019, which the Commission approved on April 12, 2018.[20]

On November 2, 2018, the Participants filed an eighteenth amendment to the Plan to transition the Plan from operating on a pilot to a permanent basis, and to revise the Plan's Appendix B regarding the Participants' requirements to report data about the Plan's ongoing operation to the Commission. The Commission approved the amendment on April 11, 2019.[21] On February 5, 2020, the Participants filed a nineteenth amendment to add a new Participant to the Plan, which was immediately effective.[22] On March 17, 2020, the Participants filed a twentieth amendment to the Plan to further revise the Plan's Appendix B, which the Commission approved on April 21, 2020.[23]

On July 29, 2020 and October 1, 2020, the Participants filed twenty-first[24] and twenty-second[25] amendments, respectively, to add new Participants to the Plan, both of which were immediately effective.

As set forth below, the Participants now propose to amend Appendix A to the Plan to provide that all exchange-traded products ("ETPs") will be assigned to Tier 1 of the Plan, except for single stock ETPs, which will be assigned to the same tier as their underlying stock, and in each case adjusted for any leverage factor.

I. Requirements Pursuant to Rule 608(a)

A. Statement of Purpose and Summary of the Plan Amendment

The Participants filed the Plan with the Commission on April 5, 2011 to create a market-wide limit up-limit down mechanism intended to address extraordinary market volatility in NMS Stocks, as defined in Rule 600(b)(55) of Regulation NMS under the Exchange Act.[26] The Plan sets forth procedures that provide for market-wide limit up-limit down requirements to prevent trades in individual NMS Stocks from occurring outside of the specified Price Bands. These limit up-limit down requirements are

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19 See Securities Exchange Act Release No. 82887 (March 15, 2018), 83 FR 12414 (March 21, 2018) (File No. 4-631).

20 See Securities Exchange Act Release No. 83044 (April 12, 2018), 83 FR 17205 (April 18, 2018) (File No. 4-631).

21 See Securities Exchange Act Release No. 85623 (April 11, 2019), 84 FR 16086 (April 17, 2019) (File No. 4-631).

22 See Securities Exchange Act Release No. 88122 (February 5, 2020), 85 FR 7805 (February 11, 2020) (File No. 4-631).

23 See Securities Exchange Act Release No. 88704 (April 21, 2020), 85 FR 23383 (April 27, 2020) (File No. 4-631).

24 See Securities Exchange Act Release No. 89420 (July 29, 2020), 85 FR 46762 (August 3, 2020) (File No. 4-631).

25 See Securities Exchange Act Release No. 90068 (October 1, 2020), 85 FR 63322 (October 7, 2020) (File No. 4-631).

26 17 CFR 242.600(b)(55).

coupled with Trading Pauses,[27] as defined in Section I(Y) of the Plan, to accommodate more fundamental price moves. In particular, the Participants adopted this Plan to address extraordinary volatility in the securities markets, *i.e.*, significant fluctuations in individual securities' prices over a short period of time, such as those experienced during the "Flash Crash" on the afternoon of May 6, 2010.

As set forth in more detail in the Plan, the single plan processor ("Processors"), which is responsible for consolidation of information for an NMS Stock pursuant to Rule 603(b) of Regulation NMS under the Exchange Act, calculates and disseminates a lower Price Band and upper Price Band for each NMS Stock. As set forth in Section V of the Plan, the Price Bands are based on a Reference Price for each NMS Stock that equals the arithmetic mean price of Eligible Reported Transactions for the NMS Stock over the immediately preceding five-minute period. The Price Bands for an NMS Stock are calculated by applying the Percentage Parameters, as set out in Appendix A to the Plan, for such NMS Stock to the Reference Price, with the lower Price Band being a Percentage Parameter below the Reference Price, and the upper Price Band being a Percentage Parameter above the Reference Price.

Appendix A to the Plan sets out the definitions of Tier 1 and Tier 2 NMS Stocks and the Percentage Parameters for each. Appendix A currently provides that Tier 1 includes all NMS Stocks included in the S&P 500 Index and the Russell 1000 Index, as well as "eligible" ETPs. Appendix A specifies:

> To determine eligibility for an ETP to be included as a Tier 1 NMS Stock, all ETPs across multiple asset classes and issuers, including domestic equity, international equity, fixed income, currency, and commodities and futures will be identified. Leveraged ETPs will be excluded, and the list will be sorted by notional consolidated average daily volume ("CADV"). The period used to measure CADV will be from the first day of the previous fiscal half year up until one week before the beginning of the next fiscal half year. Daily volumes will be multiplied by closing prices and then averaged over the period. ETPs, including inverse ETPs, that trade over $2,000,000 CADV will be eligible to be included as a Tier 1 NMS Stock.

The eligible ETPs are then listed in Schedule 1 to Appendix A, and the list is reviewed and updated semi-annually. All ETPs that do not meet the "eligibility" definition are currently assigned to Tier 2.

For Tier 1 NMS Stocks, Appendix A defines the Percentage Parameters as:

- 5% for Tier 1 NMS Stocks with a Reference Price more than $3.00;
- 20% for Tier 1 NMS Stocks with a Reference Price equal to $0.75 and up to and including $3.00; and
- The lesser of $0.15 or 75% for Tier 1 NMS Stocks with a Reference Prices less than $0.75.

For Tier 2 NMS Stocks, Appendix A defines the Percentage Parameters as:

- 10% for Tier 2 NMS Stocks with a Reference Price of more than $3.00;

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[27] As used in this proposal, the capitalized term "Trading Pause" means a trading pause as defined in the LULD Plan, and not any other type of trading pause or halt.

- 20% for Tier 2 NMS Stocks with a Reference Price equal to $0.75 and up to and including $3.00; and
- The lesser of $0.15 or 75% for Tier 2 NMS Stocks with a Reference Price less than $0.75.

The Percentage Parameter for a Tier 2 NMS Stock that is a leveraged ETP is the applicable Percentage Parameter set forth above, multiplied by the leverage ratio of such product.

At the request of market participants, the Participants have studied the calibration of the parameters set forth in the Plan with respect to ETPs in Tier 2, and, specifically, whether the ETPs currently in Tier 2 should be consolidated into Tier 1. The Participants undertook this study at the request of ETP issuers who are concerned about protecting investors from the harm caused by sharp moves in ETP prices when execution prices diverge from their indicative index value. The purpose of the Participants' study was to assess whether improving investor protection by narrowing the Percentage Parameters from 10% to 5% on Tier 2 ETPs with Reference Prices of more than $3.00 would result in an unreasonable disruption in trading, which might hamper the price discovery process.

The Participants, in conjunction with the Plan Advisors and ETP issuers, studied the potential impact of recategorizing all ETPs currently in Tier 2 into Tier 1, such that they would be subject to narrower Percentage Parameters, and, in turn, narrower Price Bands. The Participants presented their initial findings to Commission staff at a meeting of the LULD Plan Operating Committee on February 25, 2020, and provided supplemental information as a part of the Operating Committee's 2019 Annual Report, submitted in March 2020. The Participants have received and reviewed feedback from Commission staff.

Since that time, the Participants have incorporated additional analyses bearing on the question of whether any ETPs should remain in Tier 2, or whether the operation of fair and orderly markets would be enhanced by moving all ETPs (except for single-stock ETPs whose underlying stock is in Tier 2) to Tier 1. The results of this expanded study are presented below.

For the reasons below, the Participants propose to amend Appendix A of the Plan as follows. The Participants propose to amend Appendix A, Section I, paragraph (1) to delete the definition of ETPs "eligible" for Tier 1 and to specify that all ETPs except for single-stock ETPs would be assigned to Tier 1:

> (1) Tier 1 NMS Stocks shall include all NMS Stocks included in the S&P 500 Index and the Russell 1000 Index, and [the] <u>all</u> exchange-traded products ("ETP")<u>, except for single stock ETPs, which will be assigned to the same Tier as their underlying stock, adjusted for any leverage factor.</u> [~~identified as Schedule 1 to this Appendix. Schedule 1 to the Appendix will be reviewed and updated semi-annually based on the fiscal year by the Primary Listing Exchange to add ETPs that meet the criteria, or delete ETPs that are no longer eligible. To determine eligibility for an ETP to be included as a Tier 1 NMS Stock, all ETPs across multiple asset classes and issuers, including domestic equity, international equity, fixed income, currency, and commodities and futures will be identified. Leveraged ETPs will be excluded and the list will be sorted by notional consolidated average daily volume ("CADV"). The period used to measure CADV will be from the first day of the previous fiscal half year up until one week before the beginning of the next fiscal half year. Daily volumes will be multiplied by closing prices and then averaged over the period. ETPs, including inverse ETPs, that trade over $2,000,000 CADV will be eligible to be included as a Tier 1 NMS Stock. The semi-annual updates to~~

~~Schedule 1 do not require an amendment to the Plan. The Primary Listing Exchanges will maintain the updated Schedule 1 on their respective websites.~~]

The Participants also propose to delete Schedule 1 to Appendix A as obsolete.

Because all leveraged ETPs (except Tier 2 single stock ETPs) would be assigned to Tier 1, the Participants also propose to add text into Section I of Appendix A describing how the Percentage Parameters would be set for leveraged ETPs. The Participants propose to insert the following as paragraph (5) of Section I, and to renumber the paragraphs of Section I accordingly:

> (5) Notwithstanding the foregoing, the Percentage Parameters for a Tier 1 NMS Stock that is a leveraged ETP shall be the applicable Percentage Parameter set forth in clauses (2), (3), or (4) above, multiplied by the leverage ratio of such product.

Study Data

The Participants reviewed trading and quoting in all ETPs during the period from Q4 of 2019 through Q2 of 2021. This span included periods of greatly varying volatility and heterogeneous market conditions, including the sell-off during the onset of Covid-19 pandemic, the volatile period surrounding the 2020 U.S. presidential election, and the meme stock episode in early 2021. This time span afforded the Participants the opportunity to study how the Plan performed during these particularly stressful periods.

The ETPs studied covered several asset classes, including domestic equities, international equities, fixed income, currency, commodity, and digital currency ETPs.

At the time the Participants conducted the study, there were not yet any single stock ETPs listed in the U.S. markets. However, as discussed below, the purpose of having different LULD tiers is to assign price bands that are commensurate with a security's underlying volatility. Since a single stock ETP should closely track the price movement and volatility of its underlying security, it should be assigned to the same LULD tier, adjusted for any leverage factor, to maintain the uniform and congruous application of LULD controls.

The Participants also excluded Tier 2 ETPs with a Reference Price of $3.00 or less, since ETPs with a Reference Price of $3.00 or less are subject to identical Percentage Parameters under Tier 1 and Tier 2. The Participants also excluded the last 25 minutes of the trading day from the study, since the Percentage Parameters for Tier 1 and Tier 2 NMS Stocks with Reference Prices more than $3.00 are identical during that period.

Study Methodology

The Participants' study consists of three parts.

First, the Participants compared the realized volatility and incidence of Limit States and Trading Halts in Tier 2 ETPs against both Tier 1 and Tier 2 non-ETPs, to review the reasonableness of assigning ETPs to Tier 2.

Second, the Participants calculated theoretical Tier 1 (i.e., 5%) Price Bands for all Tier 2 ETPs in the study. For example, normally a Tier 2 ETP with a Reference Price of $10.00 would have a lower Price Band of $9.00 and an upper Price Band of $11.00 (i.e., 10% bands). For purposes of the study,

that same ETP would have a theoretical Tier 1 lower Price Band of $9.50 and an upper Price Band of $10.50 (i.e., 5% bands). Once the theoretical narrower bands were calculated, the Participants identified all trades that occurred at prices between the theoretical narrower bands and the actual Tier 2 bands. The Participants then calculated the total notional value if all trades beyond the theoretical narrow bands had been prevented, as well as the total notional value if all such trades had occurred at the price of the new bands, to determine the range of potential notional value impact of applying Tier 1 bands to Tier 2 ETPs. The Participants also studied the price movement following these "breaches" of the theoretical narrower bands and the likelihood of reversion to determine the efficacy of tightening the bands.

Third, the Participants compared market quality changes and the frequency of Limit States and Trading Halts for Tier 1 ETPs vs. Tier 2 ETPs by studying the ETPs that shift from one tier to the other as part of the current semi-annual review process.

Study Results

1. Volatility of Tier 2 ETPs vs. Tier 1 and Tier 2 Non-ETPs

In creating the Plan in 2012, the Participants assigned ETPs with more than $2 million CADV to Tier 1 and all other ETPs to Tier 2. The $2 million CADV cutoff for Tier 1 ETPs was based on the classification under the prior single stock circuit breaker pilot,[28] which applied to "more liquid ETPs . . . with a minimum average daily volume of $2,000,000 . . . that tend to have similar trading characteristics as securities in the S&P 500 and Russell 1000."[29] However, given the need for a swift regulatory response to the Flash Crash, the single stock circuit breaker pilot was adopted without an opportunity for the Participants to properly study this classification -- or the underlying assumptions it was based upon -- and no additional analysis was conducted in connection with the adoption of the LULD Plan pilot in 2012.

For the first part of the study, the Participants examine the reasonableness of the assumption that only "more liquid ETPs . . . tend to have similar trading characteristics as securities in the S&P 500 and Russell 1000" by comparing the volatility of Tier 2 ETPs during the study period to the volatility of non-ETP securities. If the purpose of Tier 2's wider bands is to address higher expected volatility in Tier 2 NMS Stocks, but ETPs in Tier 2 are already less volatile than non-ETPs in Tier 1, that would suggest that ETPs do not actually need Tier 2's wider bands.

Except for single-stock, commodity, and foreign exchange-based ETPs, ETPs are, by definition, diversified instruments. According to modern portfolio theory, one would expect that a portfolio of securities will exhibit lower volatility than individual securities, unless those products are perfectly

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28 See Letter from Janet M. McGinness, Senior Vice President, Legal and Corporate Secretary, NYSE Euronext on behalf of the NYSE Exchanges as well as the other parties to the Plan, to Elizabeth M. Murphy, Secretary, Commission, dated November 2, 2011 ("Including only certain ETPs in Tier 1 NMS Stocks and including ETPs in the Plan in phases would treat ETPs in the same manner as they were treated in the trading pause pilot.").

29 See Securities Exchange Act Release No. 62883 (September 10, 2010), 75 FR 56608 (September 16, 2010) (SR-FINRA-2010-033) (Order Approving Proposed Rule Change Relating To Expanding the Pilot Rule for Trading Pauses Due to Extraordinary Market Volatility to the Russell 1000® Index and Specified Exchange Traded Products).

correlated. The results of the study show that this is in fact the case. Notwithstanding the lower trading volumes associated with the less liquid ETPs included in Tier 2, Tier 2 ETPs exhibit volatilities that are lower than those observed for Tier 1 non-ETPs that already trade with narrower Price Bands today.

The Participants calculated quote volatilities[30] for all securities that were part of the Plan during 2021. As shown in Table 1 below, non-leveraged Tier 2 ETPs had an average quote volatility of 0.241 basis points with a 90th percentile of 0.275 basis points. Those figures are lower than for Tier 1 non-ETPs during the same period, which had an average quote volatility of 0.258 basis points with a 90th percentile of 0.446 basis points. Tier 2 non-ETPs had more than four times higher average quote volatility and almost double the average quote volatility at the 90th percentile compared to Tier 2 non-leveraged ETPs. Leveraged Tier 2 ETPs were, not surprisingly, somewhat higher than non-leveraged Tier 2 ETPs, with an average quote volatility of 0.736 basis points and a 90th percentile of 1.317 basis points. Most leveraged ETPs represent commodities or volatility index products, which would be expected to exhibit higher volatility. However, these products' Price Bands are also multiplied by their leverage factor, which makes their higher volatility relative to other ETPs acceptable.

Table 1 – Quote Volatility of Tier 1 non-ETPs vs. Tier 2 ETPs and non-ETPs During 2021 (basis points)

	Average	**90th %ile**
Tier 1 Non-ETPs	0.258	0.446
Tier 2 ETPs (non-leveraged)	0.241	0.275
Tier 2 ETPs (leveraged)	0.736	1.317
Tier 2 Non-ETPs	1.182	0.502

Next, in Table 2 below, the Participants compare the incidence of Trading Pauses and Limit States during 2021 by Tier 1 non-ETPs, Tier 2 ETPs, and Tier 2 non-ETPs priced above $3.00. The data shows that during 2021, Tier 2 non-leveraged ETPs had fewer Trading Pauses and Limit States than Tier 1 non-ETPs, even though the Tier 2 non-leveraged ETPs comprised nearly 50% more securities. In addition, Tier 2 non-ETPs had roughly four times the number of symbols, but 63 times the number of Limit States per day compared to Tier 2 non-leveraged ETPs. Tier 2 ETPs at the 90th percentile did not have any Trading Pauses, while there were 30 Trading Pauses for Tier 2 non-ETPs.

[30] The Participants measured quote volatility as the average basis point change of each second's mid-point during core hours annualized.

Table 2 – Incidence of Limit States and Trading Pauses Among Tier 1 non-ETPs and Tier 2 ETPs and non-ETPs During 2021

	Average Symbol Count	Limit States Per Day	Trading Pauses Per Day	90th %ile Limit States Per Day	90th %ile Trading Pauses Per Day
Tier 1 Non-ETPs	1023.3	18.2	0.3	17.0	0.0
Tier 2 ETPs (non-leveraged)	1520.6	4.5	0.2	2.0	0.0
Tier 2 ETPs (leveraged)	169.8	0.0	0.0	0.0	0.0
Tier 2 Non-ETPs	5918.9	284.3	14.6	460.0	30.0

There was a similar pattern in 2020.[31] In 2020, non-leveraged Tier 2 ETPs averaged 19.7 Limit States per day versus 68.8 for Tier 1 non-ETPs. Leveraged ETPs averaged 3.6 Limit States per day, but over 181 symbols, which still comes to fewer Limit States than Tier 1 securities, which average 1,003 securities covered per day. Tier 2 leveraged ETPs averaged 0.4 Trading Pauses per day, versus 2.8 for non-leveraged Tier 2 ETPs and 6.4 for Tier 1 non-ETPs. The 90th percentile results also evidenced a far lower incidence of LULD events for non-leveraged Tier 2 ETPs compared to Tier 1 non-ETPs.

Overall, the comparison between Tier 1 non-ETPs and Tier 2 ETPs shows that quote volatility of Tier 2 ETPs operating under wider Price Bands is lower than Tier 1 non-ETPs, and that the incidence of Limit States and Trading Pauses for Tier 1 non-ETPs is substantially higher than that of Tier 2 ETPs. By contrast, Tier 2 non-ETPs are considerably more volatile than Tier 1 non-ETPs, which substantiates the wider Price Bands applied to these securities, as the higher number of Limit States and Trading Pauses in Tier 2 non-ETPs are occurring under 10% Price Bands. The Participants believe that these data indicate that the Price Bands are not well-calibrated to the realized volatility for Tier 2 ETPs and should not be twice as wide as those for Tier 1 non-ETPs.

2. Analysis of ETP Trades Executing Past Theoretical Tier 1 Bands

For the second part of the study, the Participants sought to identify the range of potential notional value that would have been impacted during the study period if trades in Tier 2 ETPs had been bounded by 5% Price Bands instead of 10% Price Bands. Specifically, the Participants calculated theoretical Tier 1 (i.e., 5%, adjusted for leverage factor) Price Bands for all Tier 2 ETPs in the study ("Theoretical Tier 1 Bands"). Once the theoretical narrower bands were calculated, the Participants identified 101,956 trades that occurred at prices between the Theoretical Tier 1 Bands and the actual Tier 2 bands. The results are shown in Table 3 below.

[31] The Participants have reviewed 2020 data from February 24, 2020 to December 31, 2020, but such data are not included in this filing.

Table 3 – Trade Counts Past Theoretical Tier 1 Bands

Period	Avg. Daily Trades	Median Daily Trades	Max Daily Trades	5th%ile Daily Trades	95th%ile Daily Trades
2019:Q4	5	3	20	1	15
2020:H1	736	39	17,785	3	2,048
2020:H2	44	23	1,841	6	88
2021:H1	102	33	1,799	4	368

Table 3 divides the study period into four different time segments: Q4 of 2019, the first half of 2020, the second half of 2020, and the first half of 2021. The number of trades occurring between the narrower Theoretical Tier 1 Bands and the actual Tier 2 bands varied substantially between these time segments, reflecting the overall trading volatility during that timeframe. For instance, the first half of 2020 shows the greatest numbers of Tier 2 ETP trades occurring between the narrower Theoretical Tier 1 Bands and the actual Tier 2 bands due to the unprecedented volatility during that period, which included the onset of the Covid-19 pandemic and four market-wide circuit breaker events. The next highest number of trades occurred during the first half of 2021, which did not include a major market-wide event but was roiled by a limited number of securities tied to the meme stock episode in Q1 of that year. The second half of 2020 was impacted by the U.S. presidential election and continued pandemic-induced volatility, while the fourth quarter of 2019 had lower volatility and a lower number of trades overall.

The Participants then calculated the upper and lower ranges of the notional value of the trades that would have been impacted during the study period if Tier 2 ETPs had been subject to the narrower Theoretical Tier 1 Bands instead of the actual Tier 2 bands. Panel A of Table 4 below assumes that all such trades would have been prevented, and thus represents the upper end of the range. Panel B assumes that all such trades would have occurred but at the level of the narrower Theoretical Tier 1 Bands, and thus represents a more conservative estimate of notional value impacted. The panels show the average, mean, maximum, 5th percentile, and 95th percentile daily statistics, as well as the total notional value impacted under each approach.

Table 4 – Notional Value Impact of Narrower Theoretical Tier 1 Bands for Tier 2 ETPs

Panel A – Notional Value Impact Assuming All Trades Prevented (Upper Bound)

Period	Avg. Daily Total $	Median Daily Total $	Max Daily Total $	5th%ile Daily Total $	95th%ile Daily Total $	Total Period $
2019:Q4	$24,442	$6,994	$308,042	$45	$80,777	$1,442,091
2020:H1	$4,617,039	$101,311	$147,025,863	$3,110	$12,830,928	$577,129,875
2020:H2	$276,811	$34,007	$23,711,212	$3,128	$330,941	$35,413,798
2021:H1	$783,202	$45,230	$46,275,381	$3,433	$2,025,125	$97,117,976
						$711,103,740

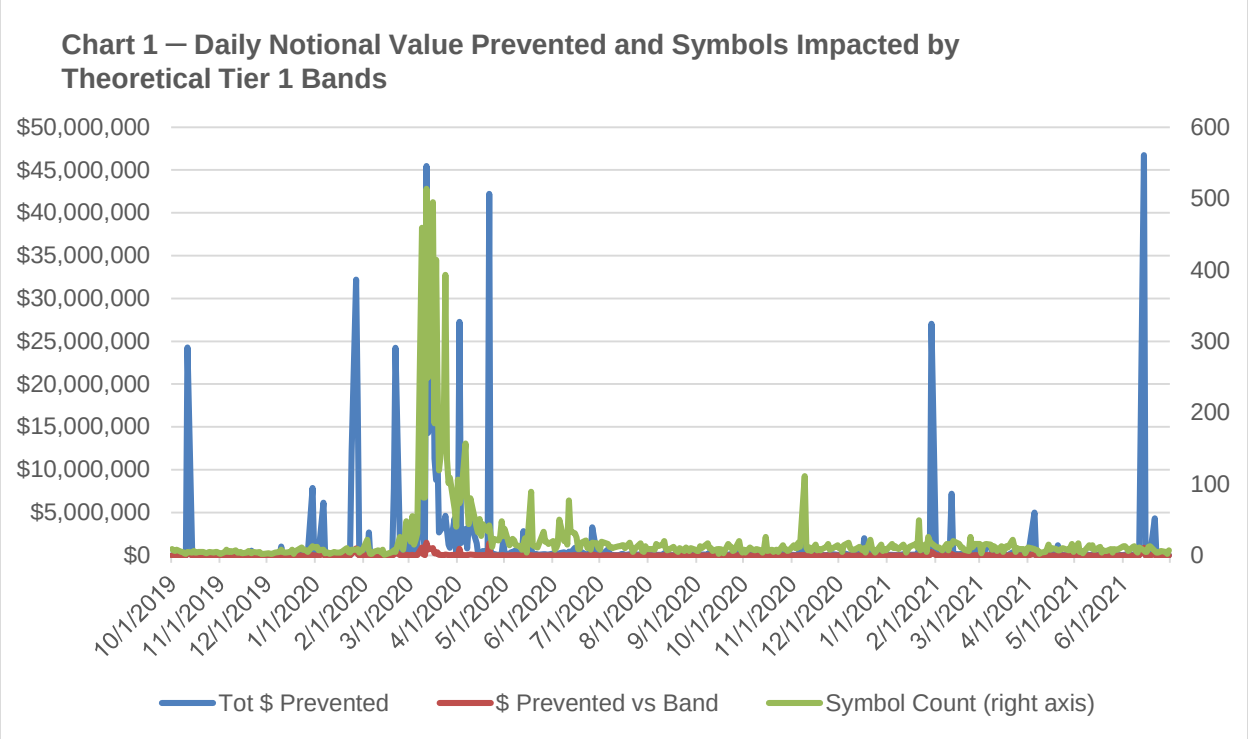
Panel B – Notional Value Impact Assuming All Trades Occur at New Bands (Lower Bound)

Period	Avg. Daily Total $	Median Daily Total $	Max Daily Total $	5th%ile Daily Total $	95th%ile Daily Total $	Total Period $
2019:Q4	$1,283	$399	$14,371	$2	$4,102	$75,709
2020:H1	$243,507	$5,202	$8,049,877	$163	$588,279	$29,956,293
2020:H2	$13,403	$1,710	$1,121,532	$158	$15,425	$1,715,602
2021:H1	$40,537	$2,319	$2,505,951	$158	$95,941	$5,026,635
						$36,774,239

The Participants believe that the notional value of trades impacted during the study period would be between these two numbers – at least $36.8 million on the lower end, with upper end at $711.1 million. This is because there would likely be more liquidity focused near the narrower Theoretical Tier 1 Bands, resulting in some of those trades executing at or near those revised bands, while other trades would have been prevented by the narrower Theoretical Tier 1 Bands. Given the lower liquidity typically available in Tier 2 ETPs, it is not likely that all of the market depth would shift to the narrower theoretical bands. However, because there could be significant additional volume executed at prices at or near the narrower bands, it is unlikely that the dollar value prevented could reach the upper bound of $711.1 million.

Daily Notional Value Prevented and Symbols Impacted by Theoretical Tier 1 Bands

The Participants drilled down into the results discussed above to determine, on a day-by-day basis, the amount of notional value prevented and the number of symbols impacted by the narrower Theoretical Tier 1 Bands. The results are shown in Chart 1 below:



As Chart 1 shows, most of the notional value that would have been prevented by using the narrower Theoretical Tier 1 Bands for Tier 2 ETPs occurred across a handful of trade dates when the markets were very volatile. Together, the 10 days with the highest notional value for trades prevented account for 59% of the trades prevented and 61% of the total notional value overall. More than $45 million in trades could have been prevented during the pandemic-driven volatility in 2020. In contrast, over the entire study period, the number of Tier 2 ETPs that would have been impacted by using narrower Theoretical Tier 1 Bands was a median of nine ETPs per day.

From Chart 1 and the data above in Tables 3 and 4, the Participants conclude that on most days, tighter Price Bands would have had little impact on the trading of Tier 2 ETPs. However, during periods of extreme volatility overall, the narrower bands may prevent unnecessary volatility in Tier 2 ETPs. Using narrower Tier 1 Bands for these ETPs could protect investors from executing trades at inferior prices that may occur due to transitory gaps in liquidity.

Price Movement After the Theoretical Blocked Trades

The Participants recognize that the positive impacts of using narrower Theoretical Tier 1 Bands would be blunted if the price trend that triggers a Trading Pause continues in the same direction. Consider, for example, an ETP with a Tier 2 upper Price Band of $11.00 and a theoretical Tier 1 narrower upper Price Band of $10.50. If prices continued to move towards or past $11.00, preventing those trades would likely result in a Trading Pause followed by an auction at a price higher than the Theoretical Tier 1 Band. In that case, investors would be negatively affected, since they could have traded at better prices if the Tier 2 Price Bands were in effect.

To study this issue, the Participants computed several statistics to measure the impact of blocking these trades at the narrower Theoretical Tier 1 Bands. The Participants calculated these statistics as

a fraction of simple trade counts, as well as the percentage of shares that were impacted by the theoretical narrower bands. The calculations are as follows:

1. Last mid-quote 5 minutes after the blocked trade compared to the trade execution price.

2. Last mid-quote 10 minutes after the blocked trade compared to the trade execution price.

3. Same as #1, except cases where the stock paused in the next 5 minutes (because there may not be reliable 5-minute mid-quotes).

4. Same as #2, except cases where the stock paused in the next 10 minutes (because there may not be reliable 10-minute mid-quotes).

5. Same as #1-#4, except measured against the theoretical narrower bands. This measures the worst-case situation, where none of the trades would have occurred and the full impact of blocking the trades is shown.

Table 5 below measures quote movement in the 5 and 10 minutes after a breach of the narrower Theoretical Tier 1 Bands. The table below presents several statistics that measure price reversion following a breach of the Theoretical Tier 1 Bands. The first two rows show the percentage of trades where the mid-quote reverts following a theoretical band breach, while the last two rows show the percentage of shares executed at prices past the new Theoretical Tier 1 Bands when the mid-quote subsequently reverts. The table shows two different reversion measures: (1) the first and third columns calculate when the last mid-quote 5 or 10 minutes after the breach reverts past the trade price that caused the breach, and (2) the second and fourth columns show what percentage of trades or share prices move back inside the new Theoretical Tier 1 Bands.

Table 5 – Price Performance Following Theoretical Blocked Trades

	Includes Pauses vs. Trade Price	**Includes Pauses vs. Revised Band**	**Excludes Pauses vs. Trade Price**	**Excludes Pauses vs. Revised Band**
5-Min % of Trades	70.5%	54.5%	71.2%	55.1%
10-Min % of Trades	75.7%	65.2%	76.0%	65.4%
5-Min % of Shares	74.2%	60.3%	74.9%	61.1%
10-Min % of Shares	78.1%	71.4%	78.3%	71.8%

As Table 5 shows, prices 5 and 10 minutes after a theoretically prevented trade usually reverted away from the offending trade price towards prior prices, and less often moved back to levels inside the new bands. When prices do not revert, the benefit of the tighter bands is less clear, but the tendency toward reversion is further evidence in support of narrowing the bands to Tier 1 levels. As shown in the first column, after 5 minutes, more than 70% of the trades and nearly 75% of the shares impacted had their last quote return to price levels prior to the move that caused the breach of the Theoretical Tier 1 Band. After 10 minutes, reversion rates improved further (i.e., more than 75% of trades and 78% of shares). When Trading Pauses are excluded (e.g., third column), the results appeared even more positive, although the Participants believe that including Trading Pauses is the superior measure, as these situations better reflect the general direction of the market.

It is worth noting that when reversion is measured relative to the narrower Theoretical Tier 1 Bands (i.e., "Revised Bands" in Table 5) instead of the price of the offending trade, mean reversion decreases. As shown in the second column, only about 54% of trades revert after 5 minutes with 65% reverting after 10 minutes and, importantly, 60% of shares revert after 5 minutes and more than 70% of shares revert after 10 minutes. These results offer strong evidence that narrowing the bands for Tier 2 ETPs will likely both decrease volatility as well as protect investors.

Likely Impact on Trading Pauses

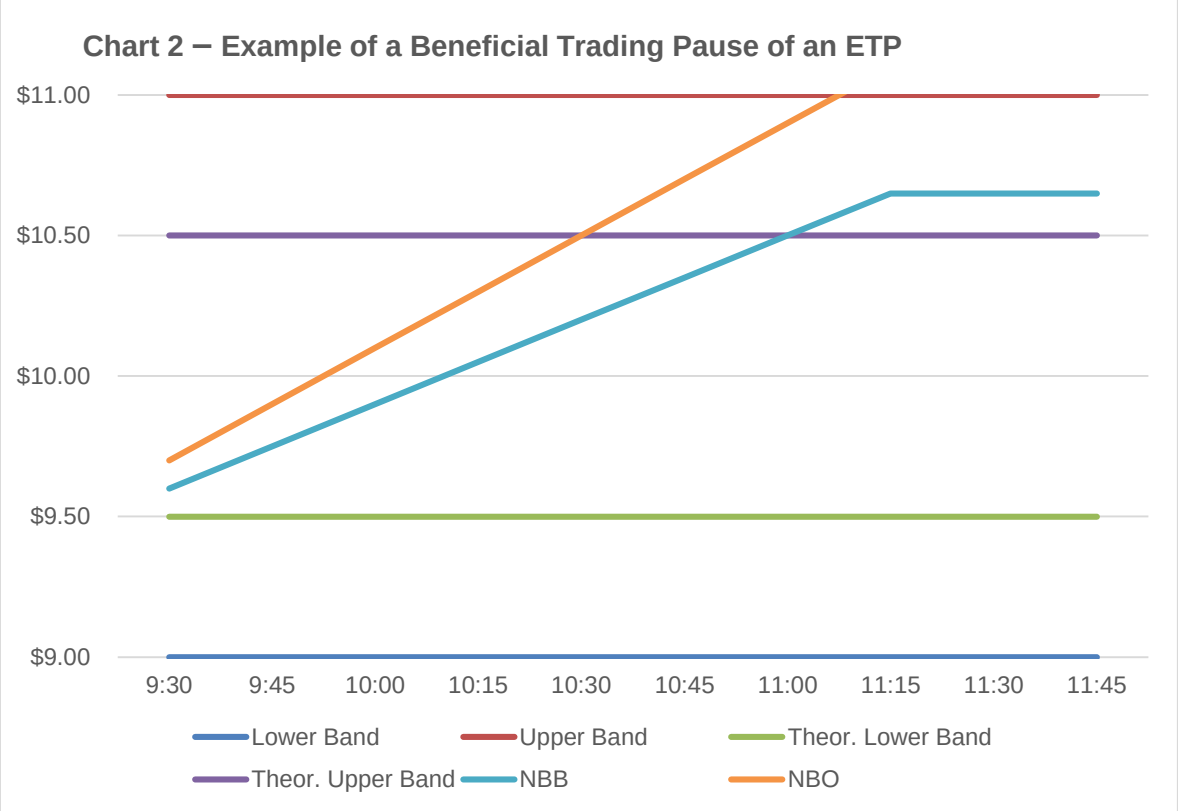
The Participants note that during the study period, only 7.1% of the trades that executed beyond the narrower Theoretical Tier 1 Bands (4.6% of shares executed across the entire study period) ultimately resulted in a Trading Pause under the LULD bands currently in place. This further highlights the benefits of tightening the bands. Prices did ultimately hit a Limit State within 10 minutes in 12.6% of the trades that moved through the bands, accounting for 10.3% of shares traded, but as noted above, less than half of these shares resulted in a Trading Pause.

The Participants note that by narrowing the bands, in all likelihood, there may be an increase in Trading Pauses, even with market makers moving liquidity in front of the revised tighter bands. Because prices may likely revert inside the bands after 10 minutes, these Trading Pauses may be beneficial for investors.

Such Trading Pauses may also be beneficial for investors because many Tier 2 ETPs do not trade actively. Their initial Price Bands are often based on the prior day's official closing price, which may not perfectly reflect current market conditions, but their Reference Prices and Price Bands are not reset if there are no trades. In such cases, it may be beneficial to trigger a Trading Pause that will permit a reopening auction, which can more efficiently aggregate liquidity, determine equilibrium prices, reset the Price Bands, and further mitigate volatility.

Consider the hypothetical situation as depicted by Chart 2 below. The red line represents the Tier 2 10% upper Price Band, while the purple line represents the theoretical narrower Tier 1 5% upper Price Band. The aqua and orange lines represent the movement of the NBBO throughout the day. An ETP's price is typically based on a basket of products, so the NBBO tracks the underlying value of the securities comprising the ETP. As the orange NBO moves above the red line at 11:15 a.m., the ETP enters a Straddle State. This means that even though the ETP's quoted prices had been rising throughout the morning, if a customer actually wanted to aggressively buy the ETP, they would not be able to because the NBO is above the upper Price Band – in a Straddle State.

Note, however, that by 11:00 a.m., the NBB had touched the theoretical narrower upper Price Band. If the ETP were then to enter a Trading Pause, the Price Bands would be reset. In this example, there would be no damage caused by the ETP entering a Trading Pause -- it was not currently trading, and the Price Bands would reset after an auction at the end of the Trading Pause (or reopening on a quote), permitting the aggressive buyer to purchase the ETP in the reopening auction or when the bands are reset and continuous trading resumes.



3. Market Quality Changes When ETPs Change Tier Designation

For the third part of the study, the Participants examined ETPs that have moved between tiers. As background, at launch, each ETP is assigned to Tier 2. Per Appendix A, tiers are recalculated at the end of each June and December and any non-leveraged ETPs that trade over $2,000,000 CADV during the measurement period move from Tier 2 to Tier 1. It is common for an otherwise-illiquid ETP to have one or two very high-volume days immediately after listing, causing it to be recategorized into Tier 1, and then ultimately settle back into Tier 2 following its second measurement period.

These tier changes provide the Participants with an opportunity to evaluate and compare the market quality of ETPs under different price band regimes. The Participants understand that, in some cases, changes in the volume of trades are what cause an ETP to change from one tier to another, and the improvements in market quality may be attributable to that increased volume, and not the tier change in and of itself. But as noted above, the Plan initially assigns ETPs into Tier 2 irrespective of their volume of trades, and many are then subsequently reassigned to Tier 1 due to high notional volume on a few days after they are first funded, without experiencing any real change in notional volume overall. As such, the Participants believe that market quality changes after a tier shift are meaningful because they are often not due to developments in the character of the market for the ETPs.

The Participants compared quoted spreads and notional liquidity at the NBBO, comparing changes in these two values from half-year to half-year for ETPs that: stayed in Tier 1; stayed in Tier 2; switched from Tier 1 to Tier 2; and switched from Tier 2 to Tier 1. Charts 3 and 4 below summarize the results.

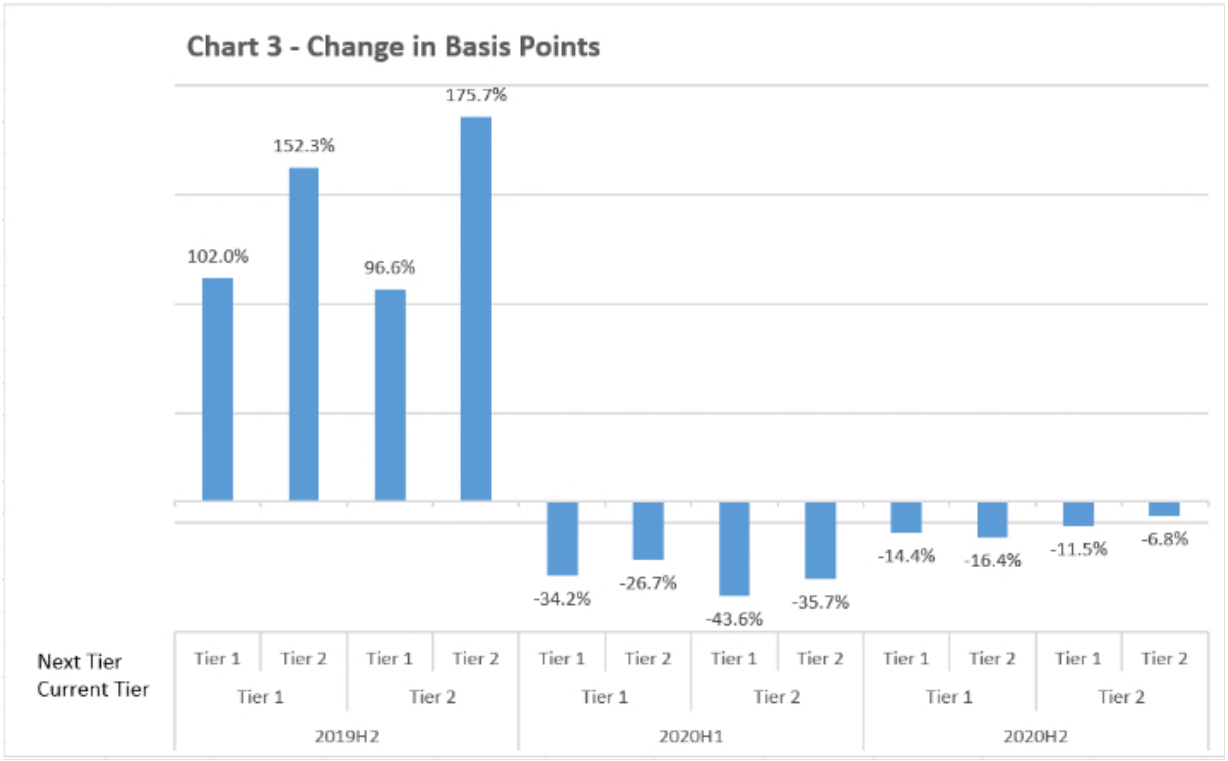
Spread Changes

Chart 3 below summarizes the changes to quoted spreads among ETPs that shifted tiers vs. stayed in their tiers.

As Chart 3 shows, ETPs that were in Tier 1 in the second half of 2019 and stayed in Tier 1 during the first half of 2020 (see the section labeled "2019H2" in Chart 2) had their consolidated quoted spread increase by 102.0%, while those that shifted to Tier 2 saw their consolidated quoted spread widen by 152.3%. Tier 2 ETPs that moved to Tier 1 in the first half of 2020 had their spreads rise 96.6% – less than those that stayed in Tier 1 for both periods. ETPs that stayed in Tier 2 performed the worst, with their spreads increasing by 175.7%.

The pattern is similar regarding ETPs that changed tier in the second half of 2020 (labeled "2020H1" in Chart 3). Chart 3 shows that ETPs that stayed in Tier 1 had their spreads narrow by 34.2% while those that moved to Tier 2 performed worse, with their spreads tightening by 26.7%. Tier 2 ETPs that remained in Tier 2 performed similarly to those that stayed in Tier 1, with their spreads narrowing by 35.7%. The best performing category was ETPs that moved to Tier 1 from Tier 2, as their spreads narrowed by 43.6%.

The last period (labeled "2020H2" in Chart 3) did not show the same consistency, but spreads were much less volatile. Chart 3 shows that spreads fell the most for ETPs that moved from Tier 1 to Tier 2. However, Tier 2 ETPs that moved to Tier 1 saw a larger drop than Tier 2 ETPs that remained in Tier 2.

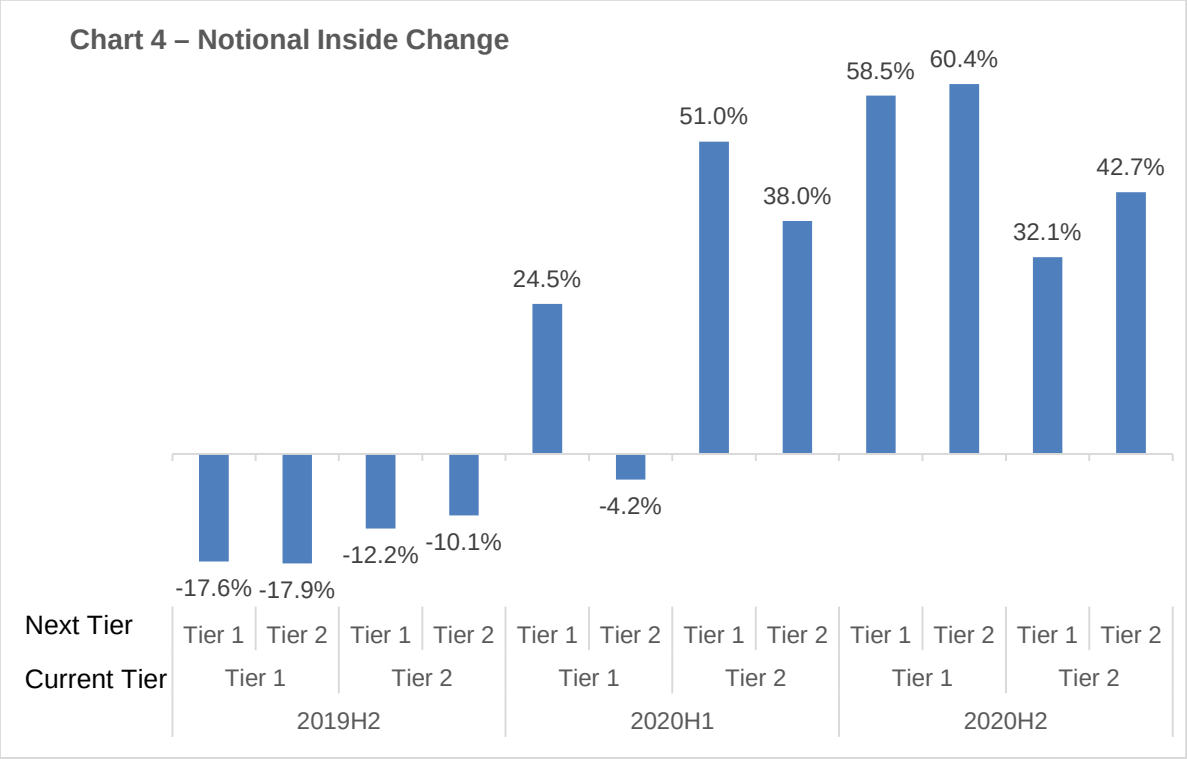


Notional Liquidity Inside

The Participants note that narrower spreads can lead to less available liquidity, but the tier changes studied above do not appear to have caused a negative impact on liquidity. Chart 4 below shows that for ETPs that changed tiers between the second half of 2019 and the first half of 2020 ("2019H2"), the amount of available liquidity dropped a similar amount for Tier 1 ETPs that stayed in Tier 1 or moved to Tier 2. Tier 2 ETPs in general lost fewer dollars at the inside, but those Tier 2 ETPs that transferred to Tier 1 did lose slightly more – 12.2% versus 10.1%.

Chart 4 shows that for ETPs that changed tiers between the first half and second half of 2020, Tier 2 ETPs again saw the largest increase in liquidity, with those that moved to Tier 1 gaining 51.0% versus just 38.0% for those that stayed in Tier 2. Tier 1 ETPs that moved to Tier 2 saw a drop in liquidity inside of 4.2%.

Finally, for those ETPs that changed tiers between the second half of 2020 and the first half of 2021, Chart 4 shows that Tier 2 ETPs that moved to Tier 1 saw the smallest gains in liquidity at the inside, increasing just 32.1% compared to Tier 2 ETPs that remained in Tier 2, which gained 42.7%. Tier 1 ETPs, whether they stayed in Tier 1 or moved to Tier 2, garnered larger gains of liquidity at the inside.



In sum, for two of the three half-year changes the Participants studied, spreads improved and there was a neutral to positive effect on inside liquidity for ETPs shifting from Tier 2 to Tier 1. The opposite was true for Tier 2 ETPs that changed tier from the second half of 2020 to the first half of 2021.

These results show that, on balance, market quality statistics improved for Tier 2 ETPs that moved to Tier 1.

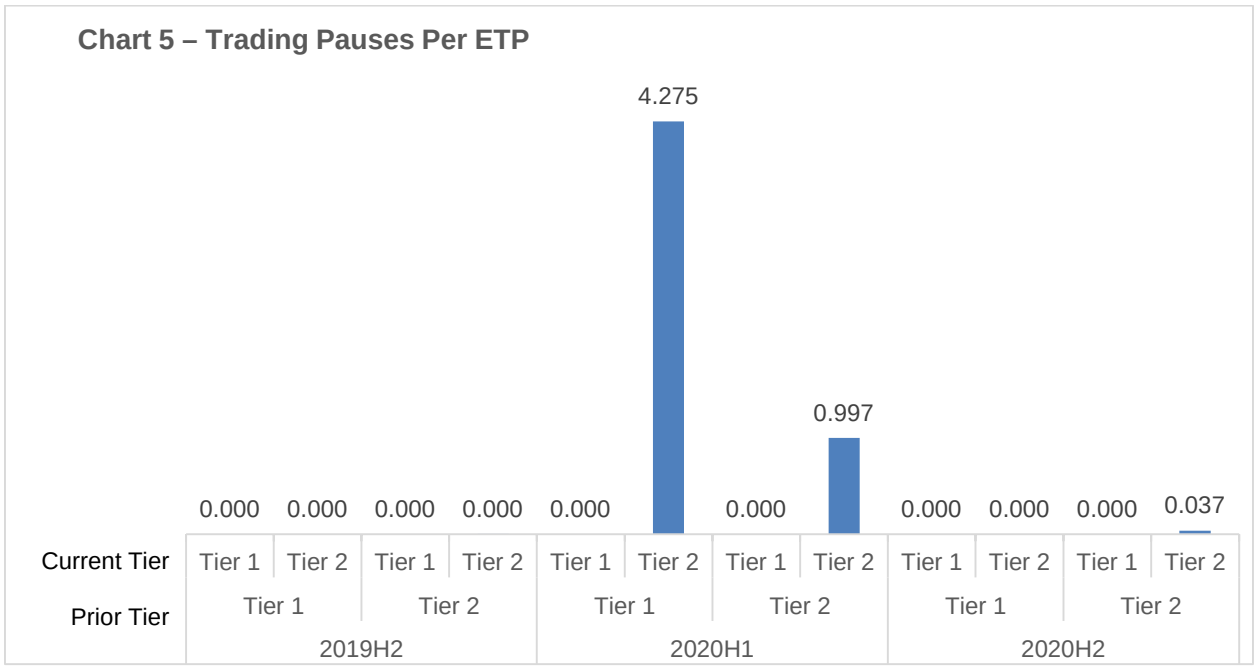
Incidence of Limit States and Trading Pauses for ETPs that Changed LULD Tiers

The Participants note that even if market quality statistics improved for Tier 2 ETPs that moved to Tier 1, the efficacy of such a move might be questioned if the move created notably more Limit States or Trading Pauses. To study this issue, the Participants examined three statistics for ETPs that had a tier change in either direction from one period to the next:

- the average number of Trading Pauses per symbol during the next half-year;
- the average number of Limit States per symbol during the next half-year; and
- the average number of seconds in a Limit State per symbol during the next half-year.

The results are shown in Charts 5, 6, and 7 below.

Regarding Trading Pauses, Chart 5 below shows that ETPs that switched from Tier 2 to Tier 1 had fewer Trading Pauses than those that remained in Tier 2. ETPs that moved from Tier 1 to Tier 2 had more Trading Pauses than those that remained in Tier 1.



Regarding Limit States, Chart 6 below shows similar results. ETPs that were recategorized from Tier 2 to Tier 1 showed a decrease in the number Limit States, while ETPs that were moved from Tier 1 to Tier 2 showed an increase in the number of Limit States.

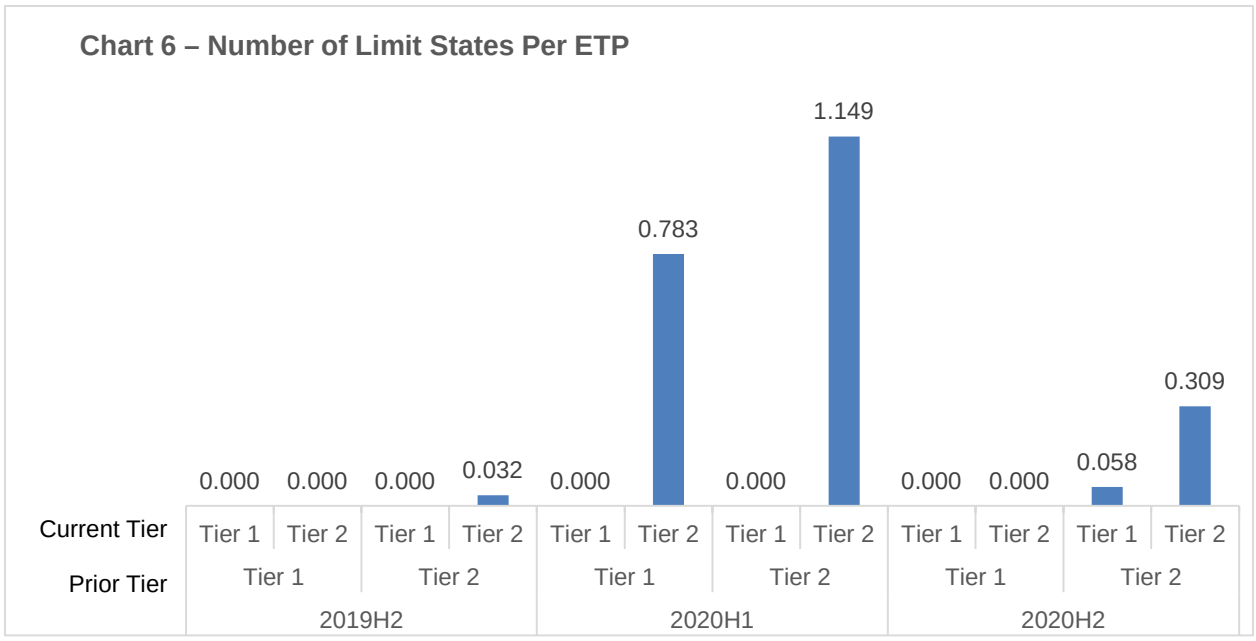
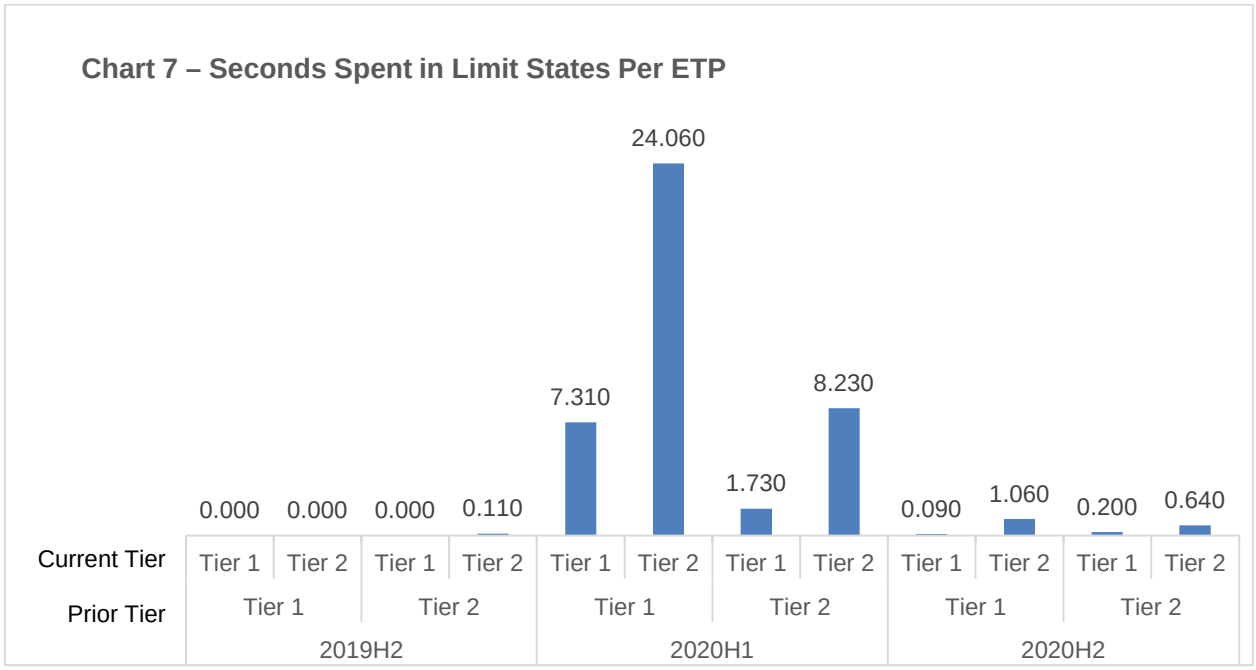


Chart 7 below shows the amount of time that ETPs spent in Limit States for each period. ETPs that moved from Tier 1 to Tier 2 spent more time in Limit States than those that remained in Tier 1. ETPs that shifted from Tier 2 to Tier 1 saw a decrease in the amount of time in Limit States when compared to Tier 2 ETPs that stayed in Tier 2.



As these data show, contrary to expectations, narrowing the Price Bands for ETPs that moved from Tier 2 into Tier 1 did not increase the incidence of Trading Pauses, Limit States, or the amount of time spent in Limit States. This is likely because market participants adjust their behavior and provide more liquidity to ETPs once their bands are tightened. The Participants acknowledge that the number

of ETPs that move between Tiers, especially into Tier 1 after being in Tier 2, is relatively small and may not provide a significant enough population to offer strong support for that statistic. The Participants note, however, that Amendment 18 removed double-wide bands at the open for all stocks and at the close for Tier 2 stocks, market participants adjusted to the tighter bands without a large increase in LULD Trading Pauses.

Study Conclusions

In sum, the Participants' study shows the following:

- Tier 1 non-ETPs are far more likely than Tier 2 ETPs to enter into Limit States and Trading Pauses due to the underlying volatility of these securities. This finding suggests that the Price Band width for Tier 2 ETPs is poorly calibrated relative to their actual trading behavior.

- During the study period, the notional value of trades that would have been prevented if Tier 2 ETPs had used tighter Tier 1 bands would have been substantial for such thinly traded products, bounded on the lower end at $36.8 million and the upper end at $711.1 million.

- In the majority of cases where a trade would have been prevented by the narrower Theoretical Tier 1 Bands, prices reverted by the end of the following 5- and 10- minute periods, suggesting that having these thinly-traded ETPs in Tier 1 would protect investors from executing trades at inferior prices that may occur due to transitory gaps in liquidity rather than fundamental valuation changes.

- In most cases where ETPs have been reclassified from Tier 2 to Tier 1, market quality improved as evidenced by the lower quote volatility, tighter spreads, and increased liquidity for ETPs that moved from Tier 2 to Tier 1.

- Using tighter Tier 1 bands for all ETPs would provide greater investor protection from temporary liquidity gaps, which are facilitated by the wider price bands in Tier 2.

- The number of Limit States and Trading Pauses decreased when Tier 2 ETPs moved to Tier 1 and increased when Tier 1 ETPs moved to Tier 2.

From this evidence, the Participants conclude that moving Tier 2 ETPs to Tier 1 would improve market quality, more effectively dampen volatility, provide greater investor protection, and decrease the number of unnecessary Limit States and Trading Pauses.

Accordingly, the Participants seek approval of this amendment because it enhances the public interest, the protection of investors, and the maintenance of fair and orderly markets, and would remove impediments to and perfect the mechanisms of a national market system in conformance with Rule 608.[32]

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[32] 17 CFR 242.608(b)(2).

B. Governing or Constituent Documents

The governing documents of the Processor, as defined in Section I(P) of the Plan, will not be affected by the Plan.

C. Implementation of Amendment

After Commission approval of the proposed amendment, the Participants propose to announce to market participants the future date on which the change will be implemented.

D. Development and Implementation Phases

The Participants propose to implement the proposed amendment on a permanent basis upon Commission approval.

E. Analysis of Impact on Competition

The Participants believe that the proposed amendment does not impose any burden on competition that is not necessary or appropriate in furtherance of the purposes of the Exchange Act. The proposed amendment to the Plan would apply to all market participants equally and would not impose a competitive burden on one category of market participants in favor of another category of market participant. The proposed amendment would apply to trading on all Trading Centers and all NMS Stocks would be subject to the amended Plan's requirements. The Participants do not believe that the proposed amendment introduces terms that are unreasonably discriminatory for the purposes of Section 11A(c)(1)(D) of the Exchange Act because it would apply to all market participants equally.

F. Written Understanding or Agreements Relating to Interpretation of, or Participation in, Plans

The Participants have no written understandings or agreements relating to interpretation of the Plan. Section II(C) of the Plan sets forth how any entity registered as a national securities exchange or national securities association may become a Participant.

G. Approval of Amendment of the Plan

On October 24, 2023, the Operating Committee, duly constituted and chaired by Mr. Robert Books of Cboe Global Markets, Inc., voted unanimously to amend the Plan as set forth herein in accordance with Section III(C) of the Plan. The Plan Advisory Committee was notified in connection with the Twenty-ThAmendment and was in favor. Each of the Plan's Participants has executed a written amended Plan.

H. Description of Operation of Facility Contemplated by the Proposed Amendment

Not applicable.

I. Terms and Conditions of Access

Section II(C) of the Plan provides that any entity registered as a national securities exchange or national securities association under the Exchange Act may become a Participant by: (1) becoming a participant in the applicable Market Data Plans, as defined in Section I(F) of the Plan; (2) executing a

copy of the Plan, as then in effect; (3) providing each then-current Participant with a copy of such executed Plan; and (4) effecting an amendment to the Plan as specified in Section III(B) of the Plan.

J. Method of Determination and Imposition, and Amount of, Fees and Charges

This section is not applicable as the proposed amendment to the Plan does not involve fees or charges.

K. Method and Frequency of Processor Evaluation

This section is not applicable as the operation of the Plan is conducted by the Primary Listing Exchange.

L. Dispute Resolution

Section III(C) of the Plan provides that each Participant shall designate an individual to represent the Participant as a member of an Operating Committee. No later than the initial date of the Plan, the Operating Committee shall designate one member of the Operating Committee to act as the Chair of the Operating Committee. Any recommendation for an amendment to the Plan from the Operating Committee that receives an affirmative vote of at least two-thirds of the Participants, but is less than unanimous, shall be submitted to the Commission as a request for an amendment to the Plan initiated by the Commission under Rule 608.

Respectfully submitted,

Hope M. Jarkowski
General Counsel
NYSE Group, Inc.

cc: Honorable Gary Gensler, Chair
Honorable Hester M. Peirce, Commissioner
Honorable Caroline A. Crenshaw, Commissioner
Honorable Mark T. Uyeda, Commissioner
Honorable Jaime Lizárraga, Commissioner
Haoxiang Zhu, Director of the Division of Trading and Markets

Exhibit A

Proposed new language is double-underlined; proposed deletions are in [~~brackets and strikethrough~~]

PLAN TO ADDRESS EXTRAORDINARY MARKET VOLATILITY

SUBMITTED TO

THE SECURITIES AND EXCHANGE COMMISSION

PURSUANT TO RULE 608 OF REGULATION NMS

UNDER THE

SECURITIES EXCHANGE ACT OF 1934

Table of Contents

Preamble

The Participants submit to the SEC this Plan establishing procedures to address extraordinary volatility in NMS Stocks. The procedures provide for market-wide limit up-limit down requirements that prevent trades in individual NMS Stocks from occurring outside of the specified Price Bands. These limit up-limit down requirements are coupled with Trading Pauses to accommodate more fundamental price moves. The Plan procedures are designed, among other things, to protect investors and promote fair and orderly markets. The Participants developed this Plan pursuant to Rule 608(a)(3) of Regulation NMS under the Exchange Act, which authorizes the Participants to act jointly in preparing, filing, and implementing national market system plans.

I. Definitions

(A) "Eligible Reported Transactions" shall have the meaning prescribed by the Operating Committee and shall generally mean transactions that are eligible to update the last sale price of an NMS Stock.

(B) "Exchange Act" means the Securities Exchange Act of 1934, as amended.

(C) "Limit State" shall have the meaning provided in Section VI of the Plan.

(D) "Limit State Quotation" shall have the meaning provided in Section VI of the Plan.

(E) "Lower Price Band" shall have the meaning provided in Section V of the Plan.

(F) "Market Data Plans" shall mean the effective national market system plans through which the Participants act jointly to disseminate consolidated information in compliance with Rule 603(b) of Regulation NMS under the Exchange Act.

(G) "National Best Bid" and "National Best Offer" shall have the meaning provided in Rule 600(b)(42) of Regulation NMS under the Exchange Act.

(H) "NMS Stock" shall have the meaning provided in Rule 600(b)(47) of Regulation NMS under the Exchange Act.

(I) "Opening Price" shall mean the price of a transaction that opens trading on the Primary Listing Exchange. If the Primary Listing Exchange opens with quotations, the "Opening Price" shall mean the closing price of the NMS Stock on the Primary Listing Exchange on the previous trading day, or if no such closing price exists, the last sale on the Primary Listing Exchange.

(J) "Operating Committee" shall have the meaning provided in Section III(C) of the Plan.

(K) "Participant" means a party to the Plan.

(L) "Plan" means the plan set forth in this instrument, as amended from time to time in accordance with its provisions.

(M) "Percentage Parameter" shall mean the percentages for each tier of NMS Stocks set forth in Appendix A of the Plan.

(N) "Price Bands" shall have the meaning provided in Section V of the Plan.

(O) "Primary Listing Exchange" shall mean the Participant on which an NMS Stock is listed. If an NMS Stock is listed on more than one Participant, the Participant on which the NMS Stock has been listed the longest shall be the Primary Listing Exchange.

(P) "Processor" shall mean the single plan processor responsible for the consolidation of information for an NMS Stock pursuant to Rule 603(b) of Regulation NMS under the Exchange Act.

(Q) "Pro-Forma Reference Price" shall have the meaning provided in Section V(A)(2) of the Plan.

(R) "Reference Price" shall have the meaning provided in Section V of the Plan.

(S) "Regular Trading Hours" shall have the meaning provided in Rule 600(b)(64) of Regulation NMS under the Exchange Act. For purposes of the Plan, Regular Trading Hours can end earlier than 4:00 p.m. ET in the case of an early scheduled close.

(T) "Regulatory Halt" shall have the meaning specified in the Market Data Plans.

(U) "Reopening Price" shall mean the price of a transaction that reopens trading on the Primary Listing Exchange following a Trading Pause or a Regulatory Halt, or, if the Primary Listing Exchange reopens with quotations, the midpoint of those quotations.

(V) "SEC" shall mean the United States Securities and Exchange Commission.

(W) "Straddle State" shall have the meaning provided in Section VII(A)(2) of the Plan.

(X) "Trading center" shall have the meaning provided in Rule 600(b)(78) of Regulation NMS under the Exchange Act.

(Y) "Trading Pause" shall have the meaning provided in Section VII of the Plan.

(Z) "Upper Price Band" shall have the meaning provided in Section V of the Plan.

II. Parties

(A) List of Parties

The parties to the Plan are as follows:

(1) Cboe BZX Exchange, Inc.
400 South LaSalle Street
Chicago, Illinois 60605

(2) Cboe BYX Exchange, Inc.
400 South LaSalle Street
Chicago, Illinois 60605

(3) Cboe EDGA Exchange, Inc.
400 South LaSalle Street
Chicago, Illinois 60605

(4) Cboe EDGX Exchange, Inc.
400 South LaSalle Street
Chicago, Illinois 60605

(5) Financial Industry Regulatory Authority, Inc.
1735 K Street, NW
Washington, DC 20006

(6) Investors Exchange LLC
4 World Trade Center, 44th Floor
New York, New York 10007

(7) Long-Term Stock Exchange, Inc.
101 Greenwich Street, Suite 11A
New York, New York 10006

(8) MEMX LLC
111 Town Square Place, Suite 520
Jersey City, New Jersey 07310

(9) MIAX Pearl, LLC
7 Roszel Road, Suite 1A
Princeton, New Jersey 08540

(10) NASDAQ BX, Inc.
One Liberty Plaza

165 Broadway
New York, New York 10006

(11) NASDAQ PHLX LLC
1900 Market Street
Philadelphia, Pennsylvania 19103

(12) The Nasdaq Stock Market LLC
One Liberty Plaza
165 Broadway
New York, NY 10006

(13) NYSE National, Inc.
11 Wall Street
New York, NY 10005

(14) New York Stock Exchange LLC
11 Wall Street
New York, New York 10005

(15) NYSE American LLC
11 Wall Street
New York, New York 10005

(16) NYSE Arca, Inc.
11 Wall Street
New York, New York 10005

(17) NYSE Chicago, Inc.
11 Wall Street
New York, New York 10005

(B) Compliance Undertaking

By subscribing to and submitting the Plan for approval by the SEC, each Participant agrees to comply with and to enforce compliance, as required by Rule 608(c) of Regulation NMS under the Exchange Act, by its members with the provisions of the Plan. To this end, each Participant shall adopt a rule requiring compliance by its members with the provisions of the Plan, and each Participant shall take such actions as are necessary and appropriate as a participant of the Market Data Plans to cause and enable the Processor for each NMS Stock to fulfill the functions set forth in this Plan.

(C) New Participants

The Participants agree that any entity registered as a national securities exchange or national securities association under the Exchange Act may become a Participant by: (1) becoming a participant in the applicable Market Data Plans; (2) executing a copy of the Plan, as then in effect; (3) providing each then-current Participant with a copy of such executed Plan; and (4) effecting an amendment to the Plan as specified in Section III (B) of the Plan.

(D) Advisory Committee

(1) Formation. Notwithstanding other provisions of this Plan, an Advisory Committee to the Plan shall be formed and shall function in accordance with the provisions set forth in this section.

(2) Composition. Members of the Advisory Committee shall be selected for two-year terms as follows:

(A) Advisory Committee Selections. By affirmative vote of a majority of the Participants, the Participants shall select at least one representatives from each of the following categories to be members of the Advisory Committee: (1) a broker-dealer with a substantial retail investor customer base; (2) a broker-dealer with a substantial institutional investor customer base; (3) an alternative trading system; (4) a broker-dealer that primarily engages in trading for its own account; and (5) an investor.

(3) Function. Members of the Advisory Committee shall have the right to submit their views to the Operating Committee on Plan matters, prior to a decision by the Operating Committee on such matters. Such matters shall include, but not be limited to, proposed material amendments to the Plan.

(4) Meetings and Information. Members of the Advisory Committee shall have the right to attend meetings of the Operating Committee and to receive any information concerning Plan matters; provided, however, that the Operating Committee may meet in executive session if, by affirmative vote

of a majority of the Participants, the Operating Committee determines that an item of Plan business requires confidential treatment.

III. Amendments to Plan

(A) General Amendments

Except with respect to the addition of new Participants to the Plan, any proposed change in, addition to, or deletion from the Plan shall be effected by means of a written amendment to the Plan that: (1) sets forth the change, addition, or deletion; (2) is executed on behalf of each Participant; and, (3) is approved by the SEC pursuant to Rule 608 of Regulation NMS under the Exchange Act, or otherwise becomes effective under Rule 608 of Regulation NMS under the Exchange Act.

(B) New Participants

With respect to new Participants, an amendment to the Plan may be effected by the new national securities exchange or national securities association executing a copy of the Plan, as then in effect (with the only changes being the addition of the new Participant's name in Section II(A) of the Plan) and submitting such executed Plan to the SEC for approval. The amendment shall be effective when it is approved by the SEC in accordance with Rule 608 of Regulation NMS under the Exchange Act or otherwise becomes effective pursuant to Rule 608 of Regulation NMS under the Exchange Act.

(C) Operating Committee

(1) Each Participant shall select from its staff one individual to represent the Participant as a member of an Operating Committee, together with a substitute for such individual. The substitute may participate in deliberations of the Operating Committee and shall be considered a voting member thereof only in the absence of the primary representative. Each Participant shall have one vote on all matters considered by the Operating Committee. No later than the initial date of Plan operations, the Operating Committee shall designate one member of the Operating Committee to act as the Chair of the Operating

Committee.

(2) The Operating Committee shall monitor the procedures established pursuant to this Plan and advise the Participants with respect to any deficiencies, problems, or recommendations as the Operating Committee may deem appropriate. The Operating Committee shall establish specifications and procedures for the implementation and operation of the Plan that are consistent with the provisions of this Plan and the Appendixes thereto. With respect to matters in this paragraph, Operating Committee decisions shall be approved by a simple majority vote.

(3) Any recommendation for an amendment to the Plan from the Operating Committee that receives an affirmative vote of at least two-thirds of the Participants, but is less than unanimous, shall be submitted to the SEC as a request for an amendment to the Plan initiated by the Commission under Rule 608 of Regulation NMS.

IV. Trading Center Policies and Procedures

All trading centers in NMS Stocks, including both those operated by Participants and those operated by members of Participants, shall establish, maintain, and enforce written policies and procedures that are reasonably designed to comply with the limit up - limit down requirements specified in Sections VI of the Plan, and to comply with the Trading Pauses specified in Section VII of the Plan.

V. Price Bands

(A) Calculation and Dissemination of Price Bands

(1) The Processor for each NMS stock shall calculate and disseminate to the public a Lower Price Band and an Upper Price Band during Regular Trading Hours for such NMS Stock. The Price Bands shall be based on a Reference Price for each NMS Stock that equals the arithmetic mean price of Eligible Reported Transactions for the NMS stock over the immediately preceding five-minute period (except for periods following openings and reopenings, which are addressed below). If no Eligible

Reported Transactions for the NMS Stock have occurred over the immediately preceding five-minute period, the previous Reference Price shall remain in effect. The Price Bands for an NMS Stock shall be calculated by applying the Percentage Parameter for such NMS Stock to the Reference Price, with the Lower Price Band being a Percentage Parameter below the Reference Price, and the Upper Price Band being a Percentage Parameter above the Reference Price. The Price Bands shall be calculated during Regular Trading Hours. Between 3:35 p.m. and 4:00 p.m. ET, or in the case of an early scheduled close, during the last 25 minutes of trading before the early scheduled close, the Price Bands shall be calculated by applying double the Percentage Parameters set forth in Appendix A for (i) all Tier 1 NMS Stocks and (ii) Tier 2 NMS Stocks priced equal to or below $3.00. If the Processor has not yet disseminated Price Bands, but a Reference Price is available, a trading center may calculate and apply Price Bands based on the same Reference Price that the Processor would use for calculating such Price Bands until such trading center receives Price Bands from the Processor. If, under Section VII(B)(2), the Primary Listing Exchange notifies the Processor that it is unable to reopen an NMS Stock due to a systems or technology issue and it has not declared a Regulatory Halt, the Processor will calculate and disseminate Price Bands by applying triple the Percentage Parameters set forth in Appendix A for the first 30 seconds such Price Bands are disseminated.

(2) The Processor shall calculate a Pro-Forma Reference Price on a continuous basis during Regular Trading Hours, as specified in Section V(A)(1) of the Plan. If a Pro-Forma Reference Price has not moved by 1% or more from the Reference Price currently in effect, no new Price Bands shall be disseminated, and the current Reference Price shall remain the effective Reference Price. When the Pro-Forma Reference Price has moved by 1% or more from the Reference Price currently in effect, the Pro-Forma Reference Price shall become the Reference Price, and the Processor shall disseminate new Price Bands based on the new Reference Price; provided, however, that each new Reference Price shall remain

in effect for at least 30 seconds.

(B) Openings

(1) Except when a Regulatory Halt is in effect at the start of Regular Trading Hours, the first Reference Price for a trading day shall be the Opening Price on the Primary Listing Exchange in an NMS Stock if such Opening Price occurs less than five minutes after the start of Regular Trading Hours. During the period less than five minutes after the Opening Price, a Pro-Forma Reference Price shall be updated on a continuous basis to be the arithmetic mean price of Eligible Reported Transactions for the NMS Stock during the period following the Opening Price (including the Opening Price), and if it differs from the current Reference Price by 1% or more shall become the new Reference Price, except that a new Reference Price shall remain in effect for at least 30 seconds. Subsequent Reference Prices shall be calculated as specified in Section V(A) of the Plan.

(2) If the Opening Price on the Primary Listing Exchange in an NMS Stock does not occur within five minutes after the start of Regular Trading Hours, the first Reference Price for a trading day shall be the arithmetic mean price of Eligible Reported Transactions for the NMS Stock over the preceding five minute time period, and subsequent Reference Prices shall be calculated as specified in Section V(A) of the Plan.

(C) Reopenings

(1) Following a Trading Pause in an NMS Stock, and if the Primary Listing Exchange has not declared a Regulatory Halt, if the Primary Listing Exchange reopens trading with a transaction or quotation that does not include a zero bid or zero offer, the next Reference Price shall be the Reopening Price on the Primary Listing Exchange. Subsequent Reference Prices shall be determined in the manner prescribed for normal openings, as specified in Section V(B)(1) of the Plan. If the Primary Listing Exchange notifies the Processor that it is unable to reopen an NMS Stock due to a systems or technology

issue, or if the Primary Listing Exchange reopens trading with a quotation that has a zero bid or zero offer, or both, the next Reference Price shall be the last effective Price Band that was in a Limit State before the Trading Pause. Subsequent Reference Prices shall be calculated as specified in Section V(A) of the Plan.

(2) Following a Regulatory Halt, the next Reference Price shall be the Opening or Reopening Price on the Primary Listing Exchange if such Opening or Reopening Price occurs within five minutes after the end of the Regulatory Halt, and subsequent Reference Prices shall be determined in the manner prescribed for normal openings, as specified in Section V(B)(1) of the Plan. If such Opening or Reopening Price has not occurred within five minutes after the end of the Regulatory Halt, the Reference Price shall be equal to the arithmetic mean price of Eligible Reported Transactions for the NMS Stock over the preceding five minute time period, and subsequent Reference Prices shall be calculated as specified in Section V(A) of the Plan.

VI. Limit Up-Limit Down Requirements

(A) Limitations on Trades and Quotations Outside of Price Bands

(1) All trading centers in NMS Stocks, including both those operated by Participants and those operated by members of Participants, shall establish, maintain, and enforce written policies and procedures that are reasonably designed to prevent trades at prices that are below the Lower Price Band or above the Upper Price Band for an NMS Stock. Single-priced opening, reopening, and closing transactions on the Primary Listing Exchange, however, shall be excluded from this limitation. In addition, any transaction that both (i) does not update the last sale price (except if solely because the transaction was reported late or because the transaction was an odd-lot sized transaction), and (ii) is excepted or exempt from Rule 611 under Regulation NMS shall be excluded from this limitation.

(2) When a National Best Bid is below the Lower Price Band or a National Best Offer is

above the Upper Price Band for an NMS Stock, the Processor shall disseminate such National Best Bid or National Best Offer with an appropriate flag identifying it as non-executable. When a National Best Offer is equal to the Lower Price Band or a National Best Bid is equal to the Upper Price Band for an NMS Stock, the Processor shall distribute such National Best Bid or National Best Offer with an appropriate flag identifying it as a "Limit State Quotation".

(3) All trading centers in NMS Stocks, including both those operated by Participants and those operated by members of Participants, shall establish, maintain, and enforce written policies and procedures that are reasonably designed to prevent the display of offers below the Lower Price Band and bids above the Upper Price Band for an NMS Stock. The Processor shall disseminate an offer below the Lower Price Band or bid above the Upper Price Band that may be submitted despite such reasonable policies and procedures, but with an appropriate flag identifying it as non-executable; provided, however, that any such bid or offer shall not be included in National Best Bid or National Best Offer calculations.

(B) Entering and Exiting a Limit State

(1) All trading for an NMS Stock shall immediately enter a Limit State if the National Best Offer equals the Lower Price Band and does not cross the National Best Bid, or the National Best Bid equals the Upper Price Band and does not cross the National Best Offer.

(2) When trading for an NMS Stock enters a Limit State, the Processor shall disseminate this information by identifying the relevant quotation (i.e., a National Best Offer that equals the Lower Price Band or a National Best Bid that equals the Upper Price Band) as a Limit State Quotation. At this point, the Processor shall cease calculating and disseminating updated Reference Prices and Price Bands for the NMS Stock until either trading exits the Limit State or trading resumes with an opening or re-opening as provided in Section V.

(3) Trading for an NMS Stock shall exit a Limit State if, within 15 seconds of entering the Limit State, the entire size of all Limit State Quotations are executed or cancelled.

(4) If trading for an NMS Stock exits a Limit State within 15 seconds of entry, the Processor shall immediately calculate and disseminate updated Price Bands based on a Reference Price that equals the arithmetic mean price of Eligible Reported Transactions for the NMS Stock over the immediately preceding five-minute period (including the period of the Limit State).

(5) If trading for an NMS Stock does not exit a Limit State within 15 seconds of entry, the Limit State will terminate when the Primary Listing Exchange declares a Trading Pause pursuant to Section VII of the Plan or at the end of Regular Trading Hours.

VII. Trading Pauses

(A) Declaration of Trading Pauses

(1) If trading for an NMS Stock does not exit a Limit State within 15 seconds of entry during Regular Trading Hours, then the Primary Listing Exchange shall declare a Trading Pause for such NMS Stock and shall notify the Processor.

(2) The Primary Listing Exchange may also declare a Trading Pause for an NMS Stock when an NMS Stock is in a Straddle State, which is when National Best Bid (Offer) is below (above) the Lower (Upper) Price Band and the NMS Stock is not in a Limit State, and trading in that NMS Stock deviates from normal trading characteristics such that declaring a Trading Pause would support the Plan's goal to address extraordinary market volatility. The Primary Listing Exchange shall develop policies and procedures for determining when it would declare a Trading Pause in such circumstances. If a Trading Pause is declared for an NMS Stock under this provision, the Primary Listing Exchange shall notify the Processor.

(3) The Processor shall disseminate Trading Pause information to the public. No trades in

an NMS Stock shall occur during a Trading Pause, but all bids and offers may be displayed.

(B) Reopening of Trading During Regular Trading Hours

(1) Five minutes after declaring a Trading Pause for an NMS Stock, and if the Primary Listing Exchange has not declared a Regulatory Halt, the Primary Listing Exchange shall attempt to reopen trading using its established reopening procedures. The Processor will publish the following information that the Primary Listing Exchange provides to the Processor in connection with such reopening: auction reference price; auction collars; and number of extensions to the reopening auction. The Trading Pause shall end when the Primary Listing Exchange reports a Reopening Price.

(2) The Primary Listing Exchange shall notify the Processor if it is unable to reopen trading in an NMS Stock due to a systems or technology issue and if it has not declared a Regulatory Halt. The Processor shall disseminate this information to the public.

(3) Trading centers may not resume trading in an NMS Stock following a Trading Pause without Price Bands in such NMS Stock.

(4) The Processor shall update the Price Bands as set forth in Section V(C)(1) – (2) of the Plan after receiving notification from the Primary Listing Exchange of a Reopening Price following a Trading Pause (or a resume message in the case of a reopening quote that has a zero bid or zero offer, or both) or that it is unable to reopen trading following a Trading Pause due to a systems or technology issue, provided that if the Primary Listing Exchange is unable to reopen due to a systems or technology issue, the update to the Price Bands will be no earlier than ten minutes after the beginning of the Trading Pause.

(C) Trading Pauses Within Ten Minutes of the End of Regular Trading Hours

(1) If an NMS Stock is in a Trading Pause during the last ten minutes of trading before the end of Regular Trading Hours, the Primary Listing Exchange shall not reopen trading and shall attempt

to execute a closing transaction using its established closing procedures. All trading centers may begin trading the NMS Stock when the Primary Listing Exchange executes a closing transaction.

(2) If the Primary Listing Exchange does not execute a closing transaction within five minutes after the end of Regular Trading Hours, all trading centers may begin trading the NMS Stock.

VIII. Implementation

The initial date of Plan operations shall be April 8, 2013.

IX. Withdrawal from Plan

If a Participant obtains SEC approval to withdraw from the Plan, such Participant may withdraw from the Plan at any time on not less than 30 days' prior written notice to each of the other Participants. At such time, the withdrawing Participant shall have no further rights or obligations under the Plan.

X. Counterparts and Signatures

The Plan may be executed in any number of counterparts, no one of which need contain all signatures of all Participants, and as many of such counterparts as shall together contain all such signatures shall constitute one and the same instrument.

IN WITNESS THEREOF, this Plan has been executed as of the ____ day of _____ 2023 by each of the parties hereto.

Cboe BZX EXCHANGE, INC.

BY:_____

Cboe BYX EXCHANGE, INC.

BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY:_____

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

IN WITNESS THEREOF, this Plan has been executed as of the 18th day of OCTOBER 2023 by each of the parties hereto.

Cboe BZX EXCHANGE, INC.

BY:_____

Cboe BYX EXCHANGE, INC.

BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY:_____

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

IN WITNESS THEREOF, this Plan has been executed as of the ____ day of _____ 2023 by each of the parties hereto.

Cboe BZX EXCHANGE, INC.

BY:_____

Cboe BYX EXCHANGE, INC.

BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY:_____

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

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IN WITNESS THEREOF, this Plan has been executed as of the ____ day of _____ 2023 by each of the parties hereto.

Cboe BZX EXCHANGE, INC.

BY:_____

Cboe BYX EXCHANGE, INC.

BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY: DocuSigned by: James Buckley 5CBB58043707 4B3...

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

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Cboe BZX EXCHANGE, INC.

BY:_____

Cboe BYX EXCHANGE, INC.

BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY:_____

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

IN WITNESS THEREOF, this Plan has been executed as of the ____ day of _____ 2023 by each of the parties hereto.

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BY:_____

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BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY:_____

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____
Barbara J. Comly, EVP & General Counsel

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

IN WITNESS THEREOF, this Plan has been executed as of the ____ day of _____ 2023 by each of the parties hereto.

Cboe BZX EXCHANGE, INC.

BY:_____

Cboe BYX EXCHANGE, INC.

BY:_____

Cboe EDGA EXCHANGE, INC.

BY:_____

Cboe EDGX EXCHANGE, INC.

BY:_____

FINANCIALINDUSTRY REGULATORY AUTHORITY, INC.

BY:_____

INVESTORS EXCHANGE LLC

BY:_____

LONG-TERM STOCK EXCHANGE

BY:_____

MEMX LLC

BY:_____

MIAX PEARL, LLC

BY:_____

NASDAQ BX, Inc.

BY:_____

NASDAQ PHLX LLC

BY:_____

THE NASDAQ STOCK MARKET LLC

BY:_____

NEW YORK STOCK EXCHANGE LLC

BY:_____

NYSE AMERICAN LLC

BY:_____

NYSE ARCA, INC.

BY:_____

NYSE CHICAGO, INC.

BY:_____

NYSE NATIONAL, INC.

BY:_____

Appendix A – Percentage Parameters

I. Tier 1 NMS Stocks

(1) Tier 1 NMS Stocks shall include all NMS Stocks included in the S&P 500 Index and the Russell 1000 Index, and [the] all exchange-traded products ("ETP"), except for single stock ETPs, which will be assigned to the same Tier as their underlying stock, adjusted for any leverage factor, if applicable. [~~identified as Schedule 1 to this Appendix. Schedule 1 to the Appendix will be reviewed and updated semi-annually based on the fiscal year by the Primary Listing Exchange to add ETPs that meet the criteria, or delete ETPs that are no longer eligible. To determine eligibility for an ETP to be included as a Tier 1 NMS Stock, all ETPs across multiple asset classes and issuers, including domestic equity, international equity, fixed income, currency, and commodities and futures will be identified. Leveraged ETPs will be excluded and the list will be sorted by notional consolidated average daily volume ("CADV"). The period used to measure CADV will be from the first day of the previous fiscal half year up until one week before the beginning of the next fiscal half year. Daily volumes will be multiplied by closing prices and then averaged over the period. ETPs, including inverse ETPs, that trade over $2,000,000 CADV will be eligible to be included as a Tier 1 NMS Stock. The semi-annual updates to Schedule 1 do not require an amendment to the Plan. The Primary Listing Exchanges will maintain the updated Schedule 1 on their respective websites.~~]

(2) The Percentage Parameters for Tier 1 NMS Stocks with a Reference Price more than $3.00 shall be 5%.

(3) The Percentage Parameters for Tier 1 NMS Stocks with a Reference Price equal to $0.75 and up to and including $3.00 shall be 20%.

(4) The Percentage Parameters for Tier 1 NMS Stocks with a Reference Price less than $0.75 shall be the lesser of (a) $0.15 or (b) 75%.

(5) Notwithstanding the foregoing, the Percentage Parameters for a Tier 1 NMS Stock that is a leveraged ETP shall be the applicable Percentage Parameter set forth in clauses (2), (3), or (4) above, multiplied by the leverage ratio of such product.

(6[~~5~~]) The Reference Price used for determining which Percentage Parameter shall be applicable during a trading day shall be based on the closing price of the NMS Stock on the Primary Listing Exchange on the previous trading day, or if no closing price exists, the last sale on the Primary Listing Exchange reported by the Processor.

II. Tier 2 NMS Stocks

(1) Tier 2 NMS Stocks shall include all NMS Stocks other than those in Tier 1, provided, however, that all rights and warrants are excluded from the Plan.

(2) The Percentage Parameters for Tier 2 NMS Stocks with a Reference Price more than $3.00 shall be 10%.

(3) The Percentage Parameters for Tier 2 NMS Stocks with a Reference Price equal to $0.75 and up to and including $3.00 shall be 20%.

(4) The Percentage Parameters for Tier 2 NMS Stocks with a Reference Price less than $0.75 shall be the lesser of (a) $0.15 or (b) 75%.

(5) Notwithstanding the foregoing, the Percentage Parameters for a Tier 2 NMS Stock that is a leveraged ETP shall be the applicable Percentage Parameter set forth in clauses (2), (3), or (4) above, multiplied by the leverage ratio of such product.

(6) The Reference Price used for determining which Percentage Parameter shall be applicable during a trading day shall be based on the closing price of the NMS Stock on the Primary Listing Exchange on the previous trading day, or if no closing price exists, the last sale on the Primary Listing Exchange reported by the Processor.

[~~Appendix A - Schedule 1~~]

Appendix B – Data and Reporting

I. Data Provision. The Commission may request from the Primary Listing Exchanges the below data that is not otherwise publicly available. The requested data shall be collected and transmitted to the Commission in an agreed-upon format, to be provided 30 calendar days following the date of the request, or such other date as agreed upon by the Commission and Primary Listing Exchange. Data collected in connection with a Commission request shall be transmitted to the Commission with a request for confidential treatment under the Freedom of Information Act, 5 U.S.C. § 552, and the Commission's rules and regulations thereunder. This section shall expire at the time the below data becomes available via the National Market System Plan Governing the Consolidated Audit Trail or becomes publicly available.

A. Data set of all orders entered during halts or Trading Pauses

   1. Normal or Auction Only orders, Arrivals, Changes, Cancels, # shares, limit/market, side, Limit State side

   2. Pipe delimited with field name as first record

B. Data set of order events received during Limit States

C. Summary data on order flow of arrivals and cancellations for each 15-second period for discrete time periods and sample stocks to be determined by the SEC in subsequent data requests. Must indicate side(s) of Limit State.

   1. Market/marketable sell orders arrivals and executions

      a. Count

      b. Shares

      c. Shares executed

   2. Market/marketable buy orders arrivals and executions

      a. Count

      b. Shares

      c. Shares executed

3. Count arriving, volume arriving and shares executing in limit sell orders above NBO mid-point

4. Count arriving, volume arriving and shares executing in limit sell orders at or below NBBO mid-point (non-marketable)

5. Count arriving, volume arriving and shares executing in limit buy orders at or above NBBO mid-point (non-marketable)

6. Count arriving, volume arriving and shares executing in limit buy orders below NBBO mid-point

7. Count and volume arriving of limit sell orders priced at or above NBBO midpoint plus $0.05

8. Count and volume arriving of limit buy orders priced at or below NBBO midpoint minus $0.05

9. Count and volume of (3-8) for cancels

10. Include: ticker, date, time at start, time of Limit State, all data item fields in 1, last sale prior to 15-second period (null if no trades today), range during 15-second period, last trade during 15-second period

II. Reporting

A. Annual Report. No later than March 31, 2020 and annually thereafter, the Operating Committee, in consultation with the Advisory committee, will provide the Commission and make publicly available a report containing key information concerning the Plan's performance during the preceding calendar year which shall include the following items: (1) an update on the Plan's operations; (2) an analysis of any amendments to the Plan implemented during the period covered by the report; and (3) an analysis of potential material emerging issues that may directly impact the operation of the Plan.

1. Update on the Plan's Operations. This section of the Annual Report shall analyze the Plan's operations during the covered period, including a discussion of any areas of the Plan's operation that require additional analysis. In particular, this section of the Annual Report shall examine the calibration of the parameters set forth in the Plan (e.g., Price Bands, duration of Limit States, impact of Straddle States, duration of Trading Pauses, and the performance of

reopening procedures following a Trading Pause). This section of the Annual Report also shall consider stock characteristics and variations in market conditions over time, and may include tests that differentiate results for different characteristics, both in isolation and in combination.

2. Analysis of Amendments Implemented. This section of the Annual Report shall provide an analysis of any amendments implemented during the covered period. The analysis shall include a discussion of any such amendment's operation and its impact on the overall operation of the Plan.

3. Analysis of Emerging Issues. This section of the Annual Report should vary from year-to-year and will include a discussion and analysis of the Plan's operation during a significant market event that may have occurred during the covered period. This section shall also include any additional analyses performed during the covered period on issues that were raised in previous Annual Reports.

B. Quarterly Data. Thirty days following the end of each calendar quarter, the Operating Committee shall provide the Commission and make publicly available a report ("Monitoring Report") including basic statistics aggregated across primary listing exchanges regarding the Plan's operation during the preceding calendar quarter, as well as data aggregated across primary listing exchanges from the previous 12 quarters beginning with the calendar quarter covered by the first Monitoring Report. The purpose of the Monitoring Report is to identify trends in the performance and impact of the Plan on market activity. The Monitoring Report shall include data on the following events for each month during the preceding calendar quarter:

1. Limit States, Trading Pauses, Straddle States, and Clearly Erroneous Events

a. Definitions. For the purpose of this Section B.1, the following definitions apply:

i. "Category" means the following categories of securities:

1) Tier 1 non-ETP securities > $3.00
2) Tier 1 non-ETP securities >= $0.75 and <= $3.00
3) Tier 1 non-ETP securities < $0.75
4) Tier 1 non-leveraged ETPs > $3.00
5) Tier 1 non-leveraged ETPs >= $0.75 and <= $3.00
6) Tier 1 non-leveraged ETPs < $0.75
7) Tier 1 leveraged ETPs > $3.00
8) Tier 1 leveraged ETPs >= $0.75 and <= $3.00
9) Tier 1 leveraged ETPs < $0.75
10) Tier 2 non-ETPs > $3.00
11) Tier 2 non-ETPs >= $0.75 and <= $3.00
12) Tier 2 non-ETPs < $0.75
13) Tier 2 non-leveraged ETPs > $3.00
14) Tier 2 non-leveraged ETPs >= $0.75 and <= $3.00
15) Tier 2 non-leveraged ETPs < $0.75
16) Tier 2 leveraged ETPs > $3.00
17) Tier 2 leveraged ETPs >= $0.75 and <= $3.00
18) Tier 2 leveraged ETPs < $0.75

ii. "Time of Day" means the following time spans:

1) Opening (prior to 9:45 am ET)
2) Regular (between 9:45 am ET and 25 minutes prior to the end of core trading hours)
3) Closing (the last 25 minutes of core trading hours)
4) Within five minutes of a Trading Pause reopen or IPO open

b. Limit States. The Monitoring Report will include:

i. Monthly distribution statistics (mean, median, 25th percentile, and maximum) on the number of Limit States per day, broken out by Category and Time of Day.

ii. Monthly distribution statistics (mean, median, 25th percentile, and maximum) on the number of NMS Stocks that experienced more than one Limit State on a single day, broken out by Category.

iii. Monthly distribution statistics (mean, median, 90th percentile, and 99th percentile) on the number of Limit States experienced per day by

individual NMS Stocks that had more than one Limit State on a single day, broken out by Category.

iv. Monthly distribution statistics (mean, median, 90th percentile, and 99th percentile) on the total length of Limit States experienced per day by individual NMS Stocks that had more than one Limit State on a single day, broken out by Category.

c. Trading Pauses. The Monitoring Report will include:

i. Monthly distribution statistics (mean, median, 25th percentile, and maximum) on the number of Trading Pauses per day, broken out by Category and Time of Day.

ii. Monthly distribution statistics (mean, median, 25th percentile, and maximum) on the number of NMS Stocks that experienced more than one Trading Pause on a single day, broken out by Category.

iii. Monthly distribution statistics (mean, median, 90th percentile, and maximum) on the number of Trading Pauses per day experienced by individual NMS Stocks having more than one Trading Pause on a single day, broken out by Category.

d. Straddle States. The Monitoring Report will include:

i. Monthly distribution statistics (mean, median, 25th percentile, and maximum) on the number of Straddle States per day, broken out by Category and Time of Day.

ii. Monthly distribution statistics (mean, median, 25th percentile, and maximum) on the number of NMS Stocks that experienced more than one Straddle State on a single day, broken out by Category.

iii. Monthly distribution statistics (mean, median, 90th percentile, and 99.9th percentile) on the total time spent in a Straddle State per day for individual NMS Stocks experiencing one or more Straddle States on a single day, broken out by Category.

e. The Monitoring Report will include the number of Clearly Erroneous Events per day for all NMS Stocks that occurred during the time when Price Bands are disseminated by the Processor, broken out by Category and Time of Day.

2. Reopening Data

a. Definitions. For the purpose of this Section B.2, the following definitions apply:

i. "Type of Reopening" means either (1) manual or (2) automated.

ii. "Category" means the following categories of securities:

1) Tier 1 non-ETP securities
2) Tier 1 non-leveraged ETPs
3) Tier 1 leveraged ETPs
4) Tier 2 non-ETP securities
5) Tier 2 non-leveraged ETPs
6) Tier 2 leveraged ETPs

iii. "Length of the Trading Pause" means the following durations:

1) less than 6 minutes (for manual reopenings) or no extensions of the Trading Pause (for automated reopenings);

2) 6 to 10 minutes (for manual reopenings) or one extension of the Trading Pause (for automated reopenings);

3) more than 10 minutes (for manual reopenings) or more than one extension of the Trading Pause (for automated reopenings)

b. The Monitoring Report will include the following monthly data on reopenings:

i. The number of Trading Pauses per month, broken out by (1) Type of Reopening, (2) Category, and (3) Length of the Trading Pause.

ii. Monthly distribution statistics (mean, median, 90th percentile, and 99th percentile) on the duration of each Trading Pause, broken out by (1) Type of Reopening and (2) Category.

iii. The number of Trading Pauses ending in a:

1) trade;

2) quote; and

3) potential closing auction,

broken out by (a) Type of Reopening, (b) Category, and (c) Length of Trading Pause.

iv. For Trading Pauses in NMS Stocks preceded by a Limit Up state, monthly distribution statistics (mean, median, 90th percentile, and 99th percentile) on the percentage price change from the Limit Up pricing that triggered the Trading Pause to the reopening price on exiting the Trading Pause (i.e., the reopening trade or midpoint price), broken out by (1) Category and (2) whether the Trading Pause ended in a trade or (3) in a quote (i.e., the reopening price was a midpoint).

v. For Trading Pauses in NMS Stocks preceded by a Limit Down state, monthly distribution statistics (mean, median, 90th percentile, and 99th percentile) on the percentage price change from the Limit Down pricing that triggered the Trading Pause to the reopening price on exiting the Trading Pause (i.e., the reopening trade or midpoint price), broken out by

(1) Category and (2) whether the Trading Pause ended in a trade or (3) in a quote (i.e., the reopening price was a midpoint).

vi. For Trading Pauses in NMS Stocks where the reopening process ended in a trade or quote (with resulting reference price equal to the midpoint of that quote), monthly distribution statistics (mean, median, 90th percentile, and 99th percentile) on the percentage price change from the reopening price on exiting the Trading Pause (i.e., the reopening trade or midpoint price) to

1) the highest price of all last sale eligible trades;

2) the lowest price of all last sale eligible trades; and

3) the trade-weighted average price of all last sale eligible trades for the five minutes following the conclusion of the Trading Pause,

broken out by (a) Category, (b) whether the Trading Pause was preceded by a Limit Up state or (c) a Limit Down state, and (d) whether the Trading Pause ended in a trade or (e) in a quote (i.e., the reopening price was a midpoint).

C. Reports on Market Events. At the Commission's request, the Operating Committee shall provide the Commission and make publicly available a report analyzing the Plan's operation during a significant market event that (1) materially impacted the trading of more than one security across multiple Trading Centers; and (2) is directly related to or implicating the performance of the Plan. Such report shall be provided to the Commission no later than 30 days following the Commission's request, or at a later date as agreed upon between the Commission and the Operation Committee. The requirement

to submit a report under this section may be satisfied by including the required analysis within an Annual Report.