# EXHIBIT E

**Exhibit Request:**

**Describe the manner of operation of the System. This description should include the following:**

**1.      The means of access to the System.**

**2.      Procedures governing entry and display of quotations and orders in the System.**

**3.      Procedures governing the execution, reporting, clearance and settlement of transactions in connection with the System.**

**4.      Proposed fees.**

**5.      Procedures for ensuring compliance with System usage guidelines.**

**6.      The hours of operation of the System, and the date on which applicant intends to commence operation of the System.**

**7.      Attach a copy of the users' manual.**

**8.      If applicant proposes to hold funds or securities on a regular basis, describe the controls that will be implemented to ensure safety of those funds or securities.**

**Response:**

**A.      Introduction**

*General*.   MIAX PEARL, LLC ("MIAX PEARL" or the "Exchange") proposes to register as a national securities exchange under Section 6 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). The Exchange will be owned by its parent company, Miami International Holdings, Inc. ("Miami Holdings") which will elect all directors of the Board of Directors of the Exchange.  However, Article II, Sections 2.4 and 2.5 of the By-Laws of the Exchange provide a process by which Exchange Members may nominate representatives to the Board that complies with the requirement for fair representation of members in the selection of directors.  See Exhibit J to this Application.  The members of the Exchange (the "Members") will consist of those broker-dealers admitted to transact business on the Exchange. Members will be subject to the Rules of the Exchange and will have representation on the Exchange's Board of Directors and certain committees.  Members who are not also stockholders of Miami Holdings will not have any ownership interest in the Exchange.

Once registered, the Exchange will operate a fully automated electronic options trading platform to buy or sell securities with a continuous, automated matching function. Liquidity will be derived from quotes as well as orders to buy and orders to sell submitted to the Exchange electronically by Members from remote locations. There will be no physical Exchange trading floor. There will be two types of Members on the Exchange – Market Makers ("Market Makers" or "MMs") and Electronic Exchange Members ("EEMs", and collectively with MMs, "Members").  Although the

Exchange will permit Members to register as Exchange Market Makers, such Market Makers will not receive special trading allocations or similar rights vis-à-vis other Members. Market Makers will have affirmative and negative market making obligations. Access to the Exchange will be through the use of Trading Permits issued to the Members.

Access to the Exchange will be open to broker-dealers registered under Section 15(b) of the Exchange Act that meet the standards for membership set forth in Chapter II of the proposed Exchange Rules. Further, all MIAX Options members in good standing will be eligible for a Trading Permit in the same membership category to trade on MIAX PEARL. For example, a Market Maker in good standing on MIAX Options will be eligible to become a Market Maker on MIAX PEARL, through the submission and approval of an Exchange Waive-In Membership Application. Members will be subject to fees for executions on the Exchange as set forth in the Rules of the Exchange or as may otherwise be determined by the Exchange from time-to-time pursuant to a fee schedule. Trading Permits will not be transferable except in the event of a change in control of a Member subject to meeting certain criteria. A more detailed description of the Membership criteria is set forth in Chapter II of the Exchange's proposed Rules. See Exhibit B to this Application.

***Regulation SCI.*** Regulation Systems Compliance and Integrity ("Regulation SCI") requires self-regulatory organizations (defined as SCI entities) to have, among other things, robust and resilient technological systems that ensure the SRO's own operational capability, including the ability to maintain effective operations, minimize or eliminate the effect of performance degradations, and have sufficient backup and recovery capabilities. Specifically, Regulation SCI Rule 1001(a) requires each SCI entity to establish, maintain and enforce written policies and procedures reasonably designed to ensure that its SCI systems have levels of capacity, integrity, resiliency, availability, and security, adequate to maintain the SCI entity's operational capability and promote the maintenance of fair and orderly markets.

Regulation SCI Rule 1001(a)(2)(v) further requires business continuity and disaster recovery plans that include maintaining backup and recovery capabilities that are both sufficiently resilient and geographically diverse. To be deemed sufficiently resilient, Regulation SCI has established a goal for SCI entities of next business day resumption of trading and two-hour resumption of critical SCI systems following a wide-scale disruption. To be considered geographically diverse, Regulation SCI provides a reasonable degree of flexibility to an SCI entity to determine the precise nature and location of its backup site. Regulation SCI does not specify a minimum distance for an SCI entity's backup and recovery facilities. However, the backup site should not rely upon the same infrastructure components nor be subject to the same vulnerabilities or risks as its primary site.

MIAX PEARL will be compliant with all aspects of Regulation SCI including the requirements for its backup and recovery capabilities. The Exchange's disaster recovery plans in general and its backup data center in particular will be robust and resilient. It should be noted that the Exchange does not plan to operate any critical SCI systems and therefore will not be required to meet the two-hour resumption of service goal set forth in the Regulation.

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In addition, with respect to personnel necessary to operate the Exchange's market in the event of a wide-scale disruption that forces the Exchange to activate its back-up recovery sites, the Exchange's staff will work remotely using facilities set-up in their homes throughout the tri-state region. Should the Exchange need to operate in a Disaster Recovery mode, all MIAX Options market and technology operations staff have the full set of tools necessary to operate the market from their at home facilities. Additionally, staff members of each of these departments work from home on a rotating schedule to ensure that their home configuration is fully functioning and that there are no issues interacting remotely with the Exchange or any of its supporting systems. MIAX Options regularly tests the use of the at-home facilities on an individual basis.

In accordance with Rule 1001(a) of Regulation SCI, the Exchange will have written policies and procedures in place that reflect its operational capabilities, including the ability to maintain effective operations, minimize or eliminate the effect of performance degradations, and have sufficient backup and recovery capabilities.

Proposed Rule 321, Business Continuity and Disaster Recovery Plans Testing Requirements for Designated Members (which is incorporated by reference to Rule 321 of MIAX Options), provides that pursuant to Regulation SCI and with respect to the Exchange's business continuity and disaster recovery plans, including its disaster recovery systems, the Exchange is required to establish standards for the designation of Members that the Exchange reasonably determines are, taken as a whole, the minimum necessary for the maintenance of fair and orderly markets in the event of the activation of such plans. The Exchange has established standards and will publish such standards in a Regulatory Circular prior to launch of the Exchange and designate Members according to those standards as set forth below. All Members are permitted to connect to the Exchange's disaster recovery systems and to participate in testing of such systems.

Proposed Rule 321 further provides that certain Members will be required to connect to the Exchange's disaster recovery systems and participate in functional and performance testing as announced by the Exchange, which shall occur at least once every 12 months. The following Members, as provided in proposed Rule 321, must participate in mandatory testing of the Exchange's disaster recovery systems: Members that have been determined by the Exchange to contribute a meaningful percentage of the Exchange's overall volume.

For purposes of identifying Members that contribute a meaningful percentage of the Exchange's overall volume ("meaningful percentage"), proposed Rule 321, Interpretations and Policies .01, provides that the Exchange will measure volume executed on the Exchange during a calendar quarter determined by the Exchange (the "measurement quarter") and published in a circular distributed to Members. The meaningful percentage will be determined by the Exchange and will be published in a circular distributed to Members. Proposed Rule 321 further provides that the meaningful percentage applicable in any measurement quarter will be published in advance of such measurement quarter and will not apply retroactively to any measurement quarter completed or in progress and that the Exchange will also individually notify all Members that will be subject to mandatory testing based on the meaningful percentage following the completion of the measurement quarter.

Any changes to the Designation Standards will be published by MIAX PEARL in a Regulatory Circular in advance of the start of any measurement quarter and will not be applied retroactively to any measurement quarter then completed or in progress.

MIAX PEARL will individually notify Designated BCP Members of their designation as such (including the Exchange volume percentage(s) such designation is based upon) promptly following completion of the applicable measurement quarter. Members designated for the first time will become subject to the requirements of proposed Rule 321 in the next calendar quarter following their receipt of notice of designation from MIAX PEARL.

This exhibit describes, in summary form, the proposed operation of the Exchange. A more detailed description of the proposed Exchange is set forth in the proposed By-Laws and Rules of the Exchange. See Exhibit A and Exhibit B to this Application.

## B.    Access to the Exchange (#1)

*Member Access*.  Members will access the Exchange electronically through the use of a variety of systems.  The Exchange will not accept telephone orders.

The Exchange has designed its systems to allow its Members to individually determine the best method for accessing the Exchange. Thus, Members may develop their own customized front-end software using protocols determined by the Exchange, or may use third-party vendors to route orders to the Exchange through a front-end or service bureau configuration.  Members will be able to access the Exchange remotely through a variety of methods and connections that support a latency equalized data exchange rate, as may be determined by the Exchange from time-to-time.

Direct access to the Exchange is available to Members at an Internet Protocol ("IP") address by one or more of the following methods: (i) electronic access at the Exchange's IP network address by the Member's own software, via communications that are compliant with the Financial Information Exchange ("FIX") protocol application programmer interface ("API") provided by the Exchange; (ii) electronic access at the Exchange's IP network address by the Member's own software via communications that are compliant with the MIAX Options Express Orders ("MEO") protocol API provided by the Exchange; or (iii) other means of access provided from time-to-time by the Exchange.  Not all order types will be available for use on each of the MEO Interface and the FIX Interface. The Exchange will issue a Regulatory Circular listing which order types, among the order types accepted by the Exchange, are available for delivery via the MEO Interface and which are available for delivery via the FIX Interface.

Members provide a unique IP address to the Exchange for each requested connection, and the Exchange then configures its routers to only allow access from the Member's IP address to a dedicated IP address on the Exchange's network.  By requiring the use of a registered IP address, the Exchange assures that only authorized Members will have access.

Members will be responsible for having procedures reasonably designed for safeguarding access to the Exchange and for notifying the Exchange upon learning that such safeguards have been compromised. Connectivity to the Exchange will occur through secure telecommunications "ports" or points of entry. Each Member will be assigned a specific port or multiple ports, each of which has a set of unique Exchange-provided login credentials assigned to that Member's registered IP address.

*Non-Member Access*. The Exchange plans to become a participant in the Decentralized Linkage Plan or any successor plan ("Linkage Plan").  If admitted as a participant to the Linkage Plan, other plan participants would be able to send orders to the Exchange in accordance with the terms of the Linkage Plan.

Non-Members may also access the Exchange pursuant to Rules governing "sponsored access" to the Exchange.  The Exchange plans to permit access by entities ("Sponsored Users") whose access is authorized in advance by entering into an arrangement with a Member ("Sponsoring Member") in accordance with the Exchange Rules. The Sponsoring Member must agree to be responsible for all trading conducted pursuant to that arrangement to the same extent as trading conducted by the Member for customers.   The Sponsoring Member is responsible for implementing policies and procedures for supervising and monitoring the trading effected pursuant to the arrangement to ensure that it is in compliance with all applicable federal

securities laws and rules and the Exchange Rules. In addition, Sponsored Users must agree to comply with all applicable Rules of the Exchange governing the entry, execution, reporting, clearing and settling of orders in securities eligible for trading on the Exchange.

## C.     Entry and Display of Quotations and Orders in the System (#2)

***Entry of Orders on the Exchange***.  Orders entered on the Exchange must be priced and must have a designated size (limit orders) or must be orders to buy or sell a stated amount of a security at the best obtainable bid or offer when the order reaches the Exchange (market orders).  A limit order designated as an intermarket sweep order ("ISO") will ignore prices on other markets.  Orders will be accepted for any security traded on the Exchange, whether submitted by a Member on a proprietary or agency basis in any size.

The following are the order types described in the Exchange Rules that will be available for use on the Exchange: market orders, limit orders, marketable limit orders, cancel-replacement orders, immediate-or-cancel orders, intermarket sweep orders, do not route orders, day limit orders, good 'til cancelled orders and post-only orders.  Each of these Exchange order types are described in detail in proposed Exchange Rule 516. The Exchange will maintain a full audit trail of every order submitted to the Exchange. Members may receive status reports regarding orders submitted to the Exchange or change or cancel an order at any time before that order is fully executed on the Exchange.

The Exchange System includes an Aggregate Risk Manager for EEMs ("ARM-E"), as described in the Exchange's proposed Rule 517A pursuant to which the System will maintain a counting program ("EEM Counting Program") for each participating EEM who has submitted an order in an EEM Specified Option Class using a specified MPID of the EEM and delivered via the MEO Interface (an "EEM ARM Eligible Order"). Using the EEM Counting Program, ARM-E protects EEMs by limiting the number of contracts they execute in an option class on the Exchange within a specified time period that has been established by the EEM (the "EEM Specified Time Period").  The EEM Specified Time Period cannot exceed 15 seconds. EEMs may also establish for each EEM Specified Option Class a percentage of their order's size (the "EEM Allowable Engagement Percentage").  When an execution of an EEM ARM-contract occurs, the System looks back over the EEM Specified Time Period to determine whether the execution is of sufficient size to trigger the ARM-E.  The System activates the ARM-E when it has determined that an EEM has traded a number of contracts equal to or above their EEM Allowable Engagement Percentage during the EEM Specified Time Period.  The ARM-E will then automatically cancel the EEM's ARM-E orders in all series of that particular option class and reject new orders by the EEM in all series of that particular EEM Specified Option Class until the EEM sends a notification to the System of the intent to reengage and submits a new order in the affected class.

The Exchange System includes an Aggregate Risk Manager for Market Makers ("ARM-M"), as described in the Exchange's proposed Rule 517B pursuant to which the System will maintain a counting program ("MM Counting Program") for each Market Maker who has submitted an order in an option class (an "MM Option Class") delivered via the MEO Interface (an "MM ARM Eligible Order").  Using the MM Counting Program, ARM-M protects Market Makers by limiting the number of contracts they execute in an option class on the Exchange within a specified time period that has been established by the Market Maker (an "MM Specified Time Period") or a default time period, neither of which can exceed 15 seconds. Market Makers establish a percentage of their order's size (the "MM Allowable Engagement Percentage") and the MM

Specified Time Period for each option class. When an execution of an MM ARM contract occurs, the System looks back over the MM Specified Time Period to determine whether the execution is of sufficient size to trigger the ARM-M. The System activates the ARM-M when it has determined that a Market Maker has traded a number of contracts equal to or above their MM Allowable Engagement Percentage during the MM Specified Time Period. The ARM-M then automatically cancels and removes the MM's ARM-M orders in all series of that particular option class and reject new orders by the Market Maker in all series of that particular Market Maker Specified Option Class until the Market Maker sends a notification to the System of the intent to reengage and submits a new order in the affected class. A Market Maker may configure enhanced Aggregate Risk Manager protections for one option class (the "ARM Class Protection"), or more than one class ("ARM Firm Protection") under proposed Rule 517B, Interpretations and Policies .01.

In order to avoid the occurrence of potential obvious or catastrophic errors on the Exchange, the Exchange System includes the MIAX PEARL Order Monitor ("MOM"), as described in the Exchange's proposed Rule 519. The MIAX PEARL Order Monitor will prevent certain orders from EEMs and MMs from executing or being placed on the Book at prices outside pre-set standard limits. The MIAX PEARL Order Monitor will also prevent certain EEM orders from executing or being placed on the Book if the size of the order exceeds the order size protection designated by the EEM submitting the order. Additionally, the System will reject any EEM orders that exceed the maximum number of open orders held in the System on behalf of a particular EEM, as designated by the EEM, and any orders that exceed the maximum number of open contracts represented by orders held in the System on behalf of a particular EEM, as designated by the EEM.

The Exchange System also includes a Risk Protection Monitor for Orders Entered via the FIX Protocol ("RPM-FIX") in proposed Rule 519A and a Risk Protection Monitor for Orders entered via MEO ("RPM-MEO") in proposed Rule 519B. The Risk Protection Monitor provides risk protections for orders entered by an EEM on the Exchange. The System maintains a counting program ("counting program") for each participating EEM that will count the number of orders entered and the number of contracts traded via an order entered by an EEM on the Exchange within a specified time period that has been established by the EEM ("specified time period"). EEMs may establish an Allowable Order Rate and/or an Allowable Contract Execution Rate. When an EEM's order is entered or when an execution of an EEM's order occurs, the System will look back over the specified time period to determine whether the order entered or the execution that occurred triggers the Risk Protection Monitor. EEMs may establish whether the Risk Protection Monitor, when triggered, will (i) prevent the System from receiving any new orders in all series in all classes from the EEM; or (ii) prevent the System from receiving any new orders in all series in all classes from the EEM and cancel all existing orders with a time-in-force of Day in all series in all classes from the EEM; or (iii) send a notification that the Risk Protection Monitor has been triggered without any further preventative or cancellation action by the System.

The System will trigger the Risk Protection Monitor when the counting program has determined either (i) that an EEM has entered during the specified time period a number of orders exceeding their Allowable Order Rate, or (ii) that an EEM has executed during the specified time period a number of contracts exceeding their Allowable Contract Execution Rate. Once engaged, the Risk Protection Monitor will then automatically either prevent the System from receiving any new orders in all series in all classes from the EEM, and, cancel all existing orders with a time-in-force of Day in all series in all classes from the EEM (if designated by the

Member's instructions), or send a notification without any further preventative or cancellation action by the System. When engaged, the Risk Protection Monitor will still allow the EEM to interact with existing orders entered prior to exceeding the Allowable Order Rate or the Allowable Contract Execution Rate, including sending cancel order messages and receiving trade executions from those orders. The Risk Protection Monitor shall remain engaged until the EEM communicates with the Help Desk to enable the acceptance of new orders. EEMs may elect to group with other EEMs under certain circumstances and with the EEM's clearing firm. EEMs may also elect to receive warning notifications under the Risk Protection Monitor. The Risk Protection Monitor works separately for orders entered via the MEO Interface and orders entered via the FIX Interface.

All options will be traded in decimals on the Exchange and consistent with the Penny Pilot Program.

***Entry of Quotations on the Exchange.*** Quotes may only be entered by Market Makers, and only in the option series to which the Market Maker is registered to trade, must be priced and must have a designated size. A quote is defined in proposed Rule 100 as a bid or offer entered by a Market Maker as a firm order that updates the Market Maker's previous bid or offer, if any. When the term order is used in the proposed Rules and a bid or offer is entered by the Market Maker in the option series to which such Market Maker is registered, such order shall, as applicable, except for IOC orders, constitute a quote or quotation for purposes of the proposed Rules. The standard minimum quote size will be one contract. All quotes shall be firm in accordance with the Market Maker's obligations under the proposed Exchange Rules and Rule 602 of Regulation NMS.

***Display of Orders.*** All orders submitted to the Exchange will be displayed unless the order is an immediately marketable order or is an immediate or cancel order. Orders submitted to the Exchange shall be displayed on an anonymous basis at the price specified by the submitting Member. Non-displayed orders will not be displayed to any Members and will not have time priority over displayed orders. In addition, the Exchange intends to become a participant in the Options Price Reporting Authority Plan ("OPRA Plan") and will collect and submit to OPRA the best buy and sell interest displayed on the Exchange in accordance with the terms of the OPRA Plan.

Certain orders available on the Exchange will be displayed at one price and executable at another price as described below. The handling by the trading System of certain orders, including certain Post-Only orders, that lock or cross the opposite side NBBO can result in the display of orders at one price and the execution at another price.

Based on Exchange System functionality, a locked or crossed market will not be displayed by the Exchange with respect to orders to buy and orders to sell submitted to the Exchange unless allowed pursuant to the Exchange Rules or a national market system plan governing locked and crossed markets. The managed interest process for orders that could not be executed or could not be executed in full ("managed orders") under proposed Rule 515(d) provides for the display of such orders one Minimum Price Variation ("MPV") away from the current opposite side NBBO and provides for the booking of the order at a price that will lock the current opposite side NBBO. It should be noted that in those situations where the execution price differs from the displayed price, the execution price will always provide price improvement over the price displayed to the incoming order. The managed interest process for orders is discussed further in Section E below.

The Post-Only Price Process set forth in proposed Rule 515(g) (the "POP Process") provides for the display of interest as follows. If the limit price of a Post-Only Order locks or crosses the current opposite side PBBO where the PBBO is the NBBO, the System will display and book the Post-Only Order one MPV away from the current opposite side PBBO. The POP Process is discussed further in Section E below.

## D.    Execution, Reporting, Clearance and Settlement Procedures (#3)

***Opening Process.*** Pursuant to proposed Rule 503, for the opening or resumption of trading of securities by the System, the Opening Process shall occur at or after 9:30 a.m. Eastern Time, if the dissemination of a regular market hours quote or trade (as determined by the Exchange) by the Market for the Underlying Security has occurred.

"Market for the Underlying Security" is defined in proposed Rule 503(a)(3) to mean either the primary listing market, the primary volume market (defined as the market with the most liquidity in that underlying security for the previous two calendar months), or the first market to open the underlying security, as determined by the Exchange on a class by class basis and announced to Members on the Exchange's website.

"Valid Width National Best Bid or Offer" or "Valid Width NBBO" is defined in proposed Rule 503(a)(4) to mean the combination of all away market quotes and any combination of MIAX PEARL Market Maker orders and quotes received from a minimum number of away markets and a minimum number of MIAX PEARL Market Makers within a specified bid/ask differential each as established and published by the Exchange on its website. The Valid Width NBBO will be configurable by the underlying, and tables with valid width differentials will be posted by MIAX PEARL on its website. Away markets that are crossed will void all Valid Width NBBO calculations. If any Market Maker orders or quotes on MIAX PEARL are crossed internally, then all such orders and quotes will be excluded from the Valid Width NBBO calculation. If any Market Maker orders or quotes on MIAX PEARL are locking or crossing the ABBO, the Market Maker's orders or quotes will be considered to be at the locked or crossed ABBO price for purposes of calculating the Valid Width NBBO.

Following the dissemination of a quote or trade in the Market for the Underlying Security (the "First Market Event") pursuant to proposed Rule 503(b) the System will pause for a period of time no longer than one-half second to allow the market place to absorb this information. In the case of a trading halt, the Opening Process shall occur when trading resumes pursuant to proposed Rule 504. Market hours trading shall commence or, in the case of a halted option, resume when the MIAX PEARL Opening Process concludes.

Pursuant to proposed Rule 503(b)(1), the opening of trading or resumption of trading after a halt of securities by the System will be dependent on the following criteria, provided the ABBO is not crossed. If there is a possible trade on MIAX PEARL a Valid Width NBBO must be present. If no trade is possible on MIAX PEARL, then the Exchange will open dependent upon one of the following: (A) a Valid Width NBBO is present; (B) a certain number of other options exchanges (as determined by the Exchange and posted by MIAX PEARL on its website) have disseminated a firm quote on OPRA; or (C) a certain period of time (as determined by the Exchange and posted by MIAX PEARL on its website) has elapsed.

Pursuant to proposed Rule 503(b)(2)(i), the System will determine an Opening Price during the Opening Process where there is a possible trade on MIAX PEARL. After the First Market Event has occurred or the trading halt has been lifted and the criteria for opening has been met, in each case where there are orders or quotes with internally locking or crossing prices for a particular option series the System will determine a single price at which such option series will be opened (the "Opening Price"). The Opening Price of a series will be the midpoint of the Valid Width NBBO, rounded up if necessary (the "NBBO Midpoint").

After establishing an Opening Price, pursuant to proposed Rule 503(b)(2)(ii) orders and quotes in the System that are priced equal to or more aggressively than the Opening Price will be matched based on price-time priority. Matches will occur until there is no remaining volume or there is an imbalance of orders. All orders and quotes or portions thereof that are matched pursuant to the Opening Process will be executed at the Opening Price. An imbalance of orders on the buy side or sell side may result in orders that are not executed in whole or in part. Such orders will be handled at the conclusion of the Opening Process in time sequence, beginning with the order with the oldest time stamp and may, in whole or in part, be placed on the Book, cancelled, executed, managed in accordance with proposed Rule 515, or routed in accordance with proposed Rule 529.

Pursuant to proposed Rule 503(b)(3), where there is no possible trade on MIAX PEARL the Opening Process will occur without the determination of an Opening Price. After the First Market Event has occurred or the trading halt has been lifted and the criteria for opening has been met, and where there are no contracts in a particular series that would execute at any price, the System shall open such options for trading without determining an Opening Price. The System will open such series by disseminating via a national market system plan the Exchange's best bid and offer among quotes and orders that exist in the System at that time.

**Certain Locking or Crossing Orders or Quotes.** Pursuant to proposed Rule 503(d), if any order or quote entered by a Market Maker on MIAX PEARL via the MEO Interface or the FIX Interface using the same MPID is locking or crossing another order or quote entered by the same Market Maker using the same MPID via the MEO Interface or the FIX Interface during the Opening Process, then the System will cancel the oldest of the Market Maker's locking or crossing order or quote prior to execution.

***Executions After the Opening.*** After the opening, executions on the Exchange will occur when a buy order/quote and a sell order/quote match on the Book. Pursuant to proposed Rule 514(b), such executions are allocated pursuant to price-time allocation methodology. The price-time allocation methodology provides that the System will execute all trading interest at the best price level within the System before executing trading interest at the next best price. Within each price level, if there are two or more quotes or orders at the best price, trading interest will be executed in time priority.

The Exchange System includes certain self-trade protection as set forth in proposed Rule 514(c). Orders entered by a Market Maker via the MEO Interface or the FIX Interface using the same MPID will not be executed against orders entered on the opposite side of the market by the same Market Maker using the same MPID via the MEO Interface or the FIX Interface. In such a case, the System will cancel the oldest of the orders back to the entering party prior to execution. If requested by an EEM, orders entered by an EEM via the MEO Interface using the same MPID will not be executed against orders entered on the opposite side of the market by

the same EEM using the same MPID via the MEO Interface. In such a case, the System will cancel the oldest of the orders back to the entering party prior to execution.

The Exchange's System will, when appropriate, immediately execute incoming orders or quotes against orders and quotes in the System, provided such incoming orders and quotes will not be executed at prices inferior to the NBBO.  When an incoming order is not executable or cannot be fully executed, the System will pursuant to proposed Rule 515 (Execution of Orders) handle the order by (i) posting the order or quote at its limit price; (ii) routing it to an away market; (iii) executing or cancelling the order in accordance with the price protection processes; (iv) managing it in accordance with the Managed Interest Process; and/or (v) managing it in accordance with the POP Process.

Post-Only Orders (as defined in proposed Rule 516(j)) are evaluated with respect to locking or crossing other orders as follows: (i) if a Post-Only Order would lock or cross the current opposite side PBBO where the PBBO is the NBBO (the Post-Only Order locks or crosses an order on the System), the order will be handled pursuant to the Post-Only Price Process under proposed Rule 515(g); or (ii) if a Post-Only Order would not lock or cross an order on the System but would lock or cross the ABBO where the PBBO is inferior to the ABBO, the order will be handled pursuant to the Managed Interest Process under proposed Rule 515(d)(2). The handling of a Post-Only Order may move from one process to the other (i.e., a Post-Only Order initially handled under the Post-Only Price Process may upon reevaluation be handled under the Managed Interest Process if the PBBO changes and the Post-Only Order no longer locks or crosses an order on the System but locks or crosses the ABBO).

The System provides price protection for market orders and limit orders as set forth in proposed Rule 515(c). Price protection prevents an order from being executed beyond the price designated in the order's price protection instructions (the "price protection limit").  The price protection instructions will be expressed in units of MPV away from the NBBO at the time of the order's receipt, or the PBBO if the ABBO is crossing the PBBO.  Market participants may designate price protection instructions on an order by order basis within a minimum and maximum number of MPVs away from the NBBO at the time of receipt, or the PBBO if the ABBO is crossing the PBBO, as determined by the Exchange and announced to Members through a Regulatory Circular.  The default price protection will be within 1 to 5 MPVs away from the NBBO at the time of receipt, or the PBBO if the ABBO is crossing the PBBO as determined by the Exchange and announced to Members through a Regulatory Circular.  When triggered, price protection will cancel an order or the remaining contracts of an order.

***Managed Interest Process for Orders.***  The Managed Interest Process as set forth in proposed Rule 515(d)(2) applies to orders not routable (such as an order marked "Do Not Route" or a Post-Only Order being handled under the Managed Interest Process) that would either lock or cross the ABBO where the PBBO is inferior to the ABBO.  Managed orders will be displayed at one MPV away from the current opposite side NBBO to avoid a lock or cross, but will be available for execution on the Book at a price equal to the opposite side NBBO.  The Managed Interest Process will take into account any changes to the NBBO.  If the NBBO changes to an inferior price, the managed order's displayed price will continuously re-price to one MPV away from the opposite side of the new NBBO and the price at which the managed order is available for execution on the Book will continuously re-price to be equal to the opposite side of the new NBBO.  Such re-pricing will continue until the managed order reaches its limit price, is fully executed, or is cancelled.

Any incoming order executable against a managed order will be executed at the price at which the managed order is "resting" on the Book, provided that the execution price does not violate the current NBBO.

If the Exchange receives a new Post-Only Order on the opposite side of the market from an order being managed under proposed Rule 515(d)(2) which is not a Post-Only Order and the new Post-Only Order locks or crosses the Book price of the resting order, the Exchange will reject the new Post-Only Order.

If the Exchange receives a new Post-Only Order on the opposite side of the market from a Post-Only Order being managed under proposed Rule 515(d)(2) and the new Post-Only Order locks or crosses the Book price of the resting Post-Only Order, the Exchange will re-book the resting Post-Only Order at the same price as its displayed price and manage the resting Post-Only Order and the new Post-Only Order under the POP Process of proposed Rule 515(g).

An order subject to the Managed Interest Process under proposed Rule 515(d) will retain its original limit price irrespective of the prices at which such order is booked and displayed and will maintain its original timestamp, provided however each time the order is booked and displayed at a more aggressive Book price, the order will receive a new timestamp. All orders that are re-booked and re-displayed pursuant to the Managed Interest Process will retain their priority as compared to other orders subject to the Managed Interest Process, based upon the time such order was initially received by the Exchange. Following the initial booking and display of an order subject to the Managed Interest Process, an order will only be re-booked and re-displayed to the extent it achieves a more aggressive price, provided, however, that the Exchange will re-book an order at the same price as the displayed price in the event such order's displayed price is locked or crossed by the ABBO. Such event will not result in a change in priority for the order at its displayed price.

The Booked and displayed prices of an order subject to the Managed Interest Process may be adjusted once or multiple times depending on changes to the prevailing ABBO.

Pursuant to proposed Rule 515, Interpretations and Policies .01, In the course of the Managed Interest Process for Non-Routable Orders as provided in proposed Rule 515(d)(2), if managed interest becomes tradable at multiple price points on the Exchange due to the ABBO transitioning from a crossed state to an uncrossed state, the initial trade price will be the midpoint of the PBBO, rounded up to the nearest MPV if necessary unless that price would be outside the ABBO, in which case the midpoint of the PBBO will be rounded to the nearest MPV at or inside the ABBO if necessary. An imbalance of orders on the buy side or sell side may result in orders that are not executed in whole or in part. Such orders will be handled in time sequence, beginning with the order with the oldest time stamp and may, in whole or in part, be placed on the Book, cancelled, executed, or routed in accordance with proposed Rule 529.

**Post-Only Price Process.**

The Post-Only Price Process (the "POP Process") as set forth in proposed Rule 515(g) applies to Post-Only orders where the limit price of the Post-Only Order locks or crosses the current opposite side PBBO where the PBBO is the NBBO (the Post-Only Order locks or crosses an order on the System).

The System will apply price protection to all Post-Only Orders being handled under the POP Process.

A Post-Only Order subject to the POP Process may execute on the Exchange at a price equal to or better than, but not inferior to, the ABBO. The System will not execute a Post-Only Order at prices inferior to the current NBBO. Pursuant to proposed Rule 515(g)(3)(i), the System will seek to trade the resting Post-Only Order until the first of: (A) the Post-Only Order is fully executed; (B) the Post-Only Order has traded to and including its price protection limit at which time any remaining contracts are canceled; or (C) the Post-Only Order has traded to and including its limit price at which time the System will attempt to display and book the initiating order at its limit price and will reevaluate the order for execution pursuant to proposed Rule 515.

Pursuant to proposed Rule 515(g)(3)(ii), if the limit price of a Post-Only Order locks or crosses the current opposite side PBBO where the PBBO is the NBBO (the Post-Only Order locks or crosses an order on the System), the System will display and book the Post-Only Order one MPV away from the current opposite side PBBO. Should the PBBO price change to an inferior price level, the Post-Only Order's Book price and displayed price will continuously re-price to one MPV away from new PBBO until (A) the Post-Only Order has traded to and including its limit price, (B) the Post-Only Order has traded to and including its price protection limit at which time any remaining contracts are cancelled, (C) the Post-Only Order is fully executed or (D) the Post-Only Order is cancelled. If the opposite side PBBO fades to a price inferior to the ABBO, the Post-Only Order will then be managed in accordance with the Managed Interest Process under proposed Rule 515(d).

If the Exchange receives a new order or quote on the opposite side of the market from the Post-Only Order that can be executed, the System will, pursuant to proposed Rule 515(g)(3)(iii)(A), immediately execute the remaining contracts from the resting Post-Only Order to the extent possible at the Post-Only Order's current Book price, provided that the execution price does not violate the current NBBO. If the Exchange receives a new Post-Only Order on the opposite side of the market from a Post-Only Order being managed under proposed Rule 515(g) which locks or crosses the Book price of the resting Post-Only Order, the Exchange will book and display the new Post-Only Order one MPV away from the current opposite side PBBO, pursuant to proposed Rule 515(g)(3)(iii)(B). If unexecuted contracts remain from the resting Post-Only Order, the size of the Post-Only Order will be revised and the PBBO disseminated to reflect the remaining contracts of the Post-Only Order, pursuant to proposed Rule 515(g)(3)(iii)(C).

As set forth in proposed Rule 515(g)(3)(iv), a Post-Only Order subject to the POP Process under proposed Rule 515(g)(3) will retain its original limit price irrespective of the prices at which such Post-Only Order is booked and displayed and will maintain its original timestamp, provided however each time the order is booked and displayed at a more aggressive Book price, the order will receive a new timestamp. In the event the PBBO changes such that a Post-Only Order subject to the POP Process would be able to be booked and displayed at its actual limit price, the Post-Only Order will receive a new timestamp. All Post-Only Orders that are re-ranked and re-displayed pursuant to the POP Process will retain their priority as compared to other orders subject to the POP Process based upon the time such Post-Only Order was initially received by the Exchange. Following the initial ranking and display of a Post Only Order subject to the POP Process, a Post Only Order will only be re-ranked and re-displayed to the extent it achieves a more aggressive price, provided, however, that the Exchange will re-book a Post-Only Order at the same price as the displayed price in the event such order's displayed price is

locked or crossed by the PBBO. Such event will not result in a change in priority for the Post-Only Order at its displayed price.

The Booked and displayed prices of a Post-Only Order subject to the POP Process may be adjusted once or multiple times depending on changes to the prevailing PBBO.

## Post-Only and Managed Interest Examples – Rule 515. Execution of Orders

**Example #1          Post-Only Price Process**

**Rule 515(g)**

*(i)      **A Post-Only Order is received by the Exchange.**  A Post-Only Order received by the Exchange when the PEARL Best Bid or Offer ("PBBO") is equal to the National Best Bid or Offer ("NBBO") will be managed in accordance to the Post-Only Price Process ("POP Process") as follows:*

<div align="center">Current Market in XYZ August 50 Calls</div>

(MPV $.01)

PBBO $1.09 (10) x $1.11 (10)
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.09 (20 contracts) x $1.11(20 contracts)

Incoming Post-Only Order arrives in the System: **Buy 5 XYZ August 50 Calls at $1.13**

1. By definition a Post-Only Order does not take liquidity.

2. Post-Only Orders are never routed to another exchange.

3. Posting this order at its current limit price so that it is a maker and not a taker would cross the NBBO, therefore the order will be managed by displaying the order to Buy one minimum price variation ("MPV") away from the current opposite side PBBO under Rule 515(g)(3)(ii).

4. The Post-Only Buy order has a book price of $1.10 and a display price of $1.10.

<div align="center">Current Market in XYZ August 50 Calls</div>

PBBO $1.10 (5) x $1.11 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (5 contracts) x $1.11 (20 contracts)

**Example #1.a          Post-Only Price Process**

**Rule 515(g)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.10 (5) x $1.11 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (5 contracts) x $1.11 (20 contracts)

*(i)*     ***PBBO worsens and remains equivalent to the NBBO.*** *The PBBO worsens when the 10 contracts offered for sale at $1.11 are executed and the next best offer to sell on the Exchange is $1.13. At the time of this execution, there is no sell interest displayed at away markets that is priced better than $1.13.*

1. The PBBO and the NBBO are equivalent at $1.10 x $1.13.

2. The Post-Only Buy order would continue to be managed under the POP Process and would be repriced one MPV away from the new PBBO as per Rule 515(g)(3)(ii).

3. The Post-Only Buy order's book price is $1.12 and its display price is $1.12.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (5) x $1.13 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price: $1.13
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (5 contracts) x $1.13 (20 contracts)

**Example #1.b          Managed Interest Process**

**Rule 515(d)(2)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.10 (5) x $1.11 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (5 contracts) x $1.11 (20 contracts)

*(i)        **PBBO worsens and is no longer equivalent to the NBBO.** The PBBO worsens when the 10 contracts for sale at $1.11 are executed. The next best offer to sell on the Exchange is priced at $1.15 and the sell interest displayed at away markets is priced at $1.13.*

1. The limit price of the Post-Only Order is $1.13 which locks the current opposite side ABBO of $1.13.

2. The Post-Only Order is managed under the Managed Interest Process Rule, 515(d)(2) and re-priced with a Book price that locks the ABBO and a displayed price which is one MPV away from the ABBO under Rule 515(d)(2)(ii).

3. The Post-Only Buy order's book price is $1.13 and its display price is $1.12.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (5) x $1.15 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.13, Limit Price $1.13
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (5 contracts) x $1.13 (10 contracts)

**Example #1.b.1     Opposite Side Order Non Post-Only**

**Rule 515(d)(2)(iii)(A)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (5) x $1.15 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.13, Limit Price $1.13
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (5 contracts) x $1.13 (10 contracts)

*(i)     Post-Only Order is being managed when a new executable order is received on the opposite side of the market.*

Incoming order arrives in the System: **Sell 2 XYZ August 50 Calls at $1.13**

1. The System immediately executes the 2 contracts at the book price of $1.13 under Rule 515(d)(2)(iii)(A).

2. The System updates the remaining size of the Post-Only interest to 3 contracts under Rule 515(d)(2)(iii)(D).

3. The remaining Post-Only interest is 3 contracts with a book price of $1.13 and a display price of $1.12.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (3) x $1.15 (10)
    <u>Post-Only interest</u>
    Buy 3 contracts, Display Price: $1.12, Book Price: $1.13, Limit Price: $1.13
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (3 contracts) x $1.13 (10 contracts)

**Example #1.b.2        Opposite Side Only – Post-Only Order Received**

**Rule 515(d)(2)(ii)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (5) x $1.15 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.13, Limit Price: $1.13
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (5 contracts) x $1.13 (10 contracts)

*(i)        **Post-Only Order is being managed when a new Post-Only Order is received on the opposite side of the market.***

Incoming Post-Only Order arrives in the System: **Sell 10 XYZ August 50 Calls at $1.12**

1. The System will re-price the book price of the resting Post-Only Order on the Buy side to its display price under Rule 515(d)(2)(iii)(C).

2. The Post-Only Buy order's book price is $1.12 and its display price is $1.12.

3. The System will manage the new Post-Only Order to Sell under the POP Process and set the book price and display price one MPV away from the opposite side PBBO, under Rule 515(g)(3)(ii).

4. The Post-Only Sell order's book price is $1.13 and its display price is $1.13.

5. Since the PBBO is now equal to the NBBO the System will also now manage the original resting Post-Only Buy order under Rule 515(g)(3) with a book and display price of $1.12 under Rule 515(g)(3)(i).

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (5) x $1.13 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price $1.13
    Sell 10 contracts, Display Price: $1.13, Book Price: $1.13, Limit Price $1.12
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (5 contracts) x $1.13 (20 contracts)

**Example #1.b.3      Less Aggressive Re-Booking of a Managed Order Based on ABBO**

**Rule 515(d)(2)(iv)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (5) x $1.15 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.13, Limit Price: $1.13
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (5 contracts) x $1.13 (10 contracts)

    *(i)      **An Away Market updates their offer price to lock the displayed price of the managed interest at $1.12.***

    1.  The System will re-book the Post-Only Buy order setting the book price equal to the display price under Rule 515(d)(2)(iv).

    2.  The Post-Only Buy order's book price is $1.12 and its display price is $1.12.

PBBO $1.12 (5) x $1.15 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price: $1.13
ABBO $1.09 (10) x $1.12 (10)
NBBO $1.12 (5 contracts) x $1.12 (10 contracts)

**Example #2.      POP Process**

**Rule 515(g)**

<div align="center">Current Market in XYZ August 50 Calls</div>

(MPV $.01)

PBBO $1.09 (10) x $1.11 (10)
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.09 (20 contracts) x $1.11 (20 contracts)

*(i)      **The Exchange receives a new Post-Only Order in a security with a $.01 Minimum Price Variation ("MPV")***

Incoming Post-Only Order arrives in the System: **Buy 5 XYZ August 50 Calls at $1.13**

1.  The System will manage the Post-Only Buy order under Rule 515(g) and book and display the order at one MPV away from the current opposite side PBBO under Rule 515(g)(3)(ii), because displaying the order at $1.11 would lock the offer at $1.11 displayed by the Exchange (as well as one or more other markets).

2.  The Post-Only Buy order's book price is $1.10 and its display price is $1.10.

<div align="center">Current Market in XYZ August 50 Calls</div>

PBBO $1.10 (5) x $1.11 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (5 contracts) x $1.11 (20 contracts)

**Example #2.a        POP Process**

**Rule 515(g)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.10 (5) x $1.11 (10)
      <u>Post-Only interest</u>
      Buy 5 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (5 contracts) x $1.11 (20 contracts)

> *(i)        **The Exchange receives an additional Post-Only Order to Buy.***

Incoming Post-Only Order arrives in the System: **Buy 7 XYZ August 50 Calls at $1.13**

> 1. The System will manage the Post-Only interest under Rule 515(g) and book and display the order at one MPV away from the current opposite side PBBO under Rule 515(g)(3)(ii).
>
> 2. The second Post-Only Buy order has a book price of $1.10 and a display price of $1.10.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.10 (12) x $1.11 (10)
      <u>Post-Only interest</u>
      Buy 5 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price: $1.13
      Buy 7 contracts, Display Price: $1.10, Book Price: $1.10, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (12 contracts) x $1.11 (20 contracts)

> *(ii)        **The PBBO worsens and remains equivalent to the NBBO.** The PBBO worsens when the 10 contracts offered for sale at $1.11 are executed and the next best offer to sell on the Exchange is $1.13. At the time of this execution, there is no sell interest displayed at away markets that is priced better than $1.13.*

> 3. The System will manage both Post-Only Orders under Rule 515(g)(3)(ii) and book and display each order at one MPV away from the opposite side PBBO.
>
> 4. The Post-Only Order to Buy 5 contracts has a display price of $1.12, a book price of $1.12, and a limit price of $1.13.
>
> 5. The Post-Only Order to Buy 7 contracts has a display price of $1.12, a book price of $1.12, and a limit price of $1.13.
>
> 6. The Post-Only Interest priced at $1.12 retains its relative priority with regards to other orders subject to the POP Process under Rule 515(g)(3)(iv).

7. The first Post-Only Buy order for 5 contracts would have time priority relative to the second Post-Only Buy order for 7 contracts.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (12) x $1.13 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price: $1.13.
    Buy 7 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price: $1.13.
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (12 contracts) x $1.13 (20 contracts)

**Example #2.b      Post-Only Order No Longer Locking or Crossing the PBBO or the ABBO**

**Rule 515(g)(3)(iv)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.12 (12) x $1.13 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price: $1.13.
    Buy 7 contracts, Display Price: $1.12, Book Price: $1.12, Limit Price: $1.13.
ABBO $1.09 (10) x $1.13 (10)
NBBO $1.12 (12 contracts) x $1.13 (20 contracts)

    *(i)      **The PBBO and the ABBO both worsen.** The most aggressive offer for sale on the Exchange is $1.17 and $1.20 at away markets.*

        1.  The limit price of the Post-Only Orders no longer locks or crosses the ABBO. The Post-Only Orders will receive new timestamps and be booked and displayed at their original limit prices under Rule 515(g)(3)(iv).

        2.  The Post-Only Order to Buy 5 contracts has a display price of $1.13, a book price of $1.13, and a limit price of $1.13.

        3.  The Post-Only Order to Buy 7 contracts has a display price of $1.13, a book price of $1.13, and a limit price of $1.13.

        4.  If there are multiple orders subject to the POP process that are being booked and displayed at their original and full limit prices, the new timestamps will be assigned such that all of the orders maintain their relative time priority under Rule 515(g)(3)(iv).

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.13 (12) x $1.17 (10)
    <u>Post-Only interest</u>
    Buy 5 contracts, Display Price: $1.13, Book Price: $1.13, Limit Price: $1.13.
    Buy 7 contracts, Display Price: $1.13, Book Price: $1.13, Limit Price: $1.13.
ABBO $1.09 (10) x $1.20 (10)
NBBO $1.13 (12 contracts) x $1.17 (10 contracts)

**Example #3.a        Multiple Re-Booking**

**Rule 515(g)(3)**

<u>Current Market in XYZ August 50 Calls</u>

(MPV $.05)

PBBO $2.50 (20) x $2.55 (50)
ABBO $2.50 (10) x $2.55 (10)
NBBO $2.50 (30 contracts) x $2.55 (60 contracts)

  *(i)  **POP Process Moving to Managed Interest Process.***

Incoming Post-Only Order arrives in the System: **Buy 100 XYZ August 50 Calls at $2.70**

1. The System will manage the Post-Only Buy order under Rule 515(g)(3)(ii) and book and display the order one MPV away from the current opposite side PBBO.

2. The Post-Only Order to Buy 100 contracts receives a book price of $2.50 and a display price of $2.50.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $2.50 (120) x $2.55 (50)
  <u>Post Only interest</u>
  Buy 100 contracts, Display Price: $2.50, Book Price: $2.50, Limit Price: $2.70
ABBO $2.50 (10) x $2.55 (10)
NBBO $2.50 (130 contracts) x $2.55 (60 contracts)

  *(ii)  **All displayed interest at $2.55 is exhausted on both the MIAX PEARL Exchange and Away markets.***

3. The System will manage the Post-Only Buy order under Rule 515(g)(3) and re-book and re-display the order one MPV away from the current opposite side PBBO under 515(g)(3)(ii).

4. The Post-Only Order to Buy 100 contracts has a book price of $2.55 and a display price of $2.55.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $2.55 (100) x $2.60 (10)
  <u>Post Only interest</u>
  Buy 100 contracts, Display Price: $2.55, Book Price: $2.55, Limit Price: $2.70
ABBO $2.50 (10) x $2.60 (10)
NBBO $2.55 (100 contracts) x $2.60 (20 contracts)

(iii)    ***All displayed interest at $2.60 is exhausted on both the MIAX PEARL Exchange and Away markets.*** *The Exchange's next most aggressively priced offer is $2.75 but the most aggressively priced sell order displayed at an away market is $2.70.*

1. The PBBO is worse than the ABBO.

2. The System will manage the Post-Only interest under the Managed Interest Process for Non-Routable Orders in Rule 515(d)(2)(ii) and re-book the Post-Only Buy order at its limit price and re-display the order one MPV away from the current opposite side ABBO.

3. The Post-Only Order to Buy 100 contracts has a book price of $2.70 and a display price of $2.65

4. At each re-booking the Post-Only interest retains its time priority relative to any other orders subject to the POP Process under Rule 515(d)(2)(iv) and Rule 515(g)(3)(iv).

<u>Current Market in XYZ August 50 Calls</u>

PBBO $2.65 (100) x $2.75 (10)
      <u>Post-Only interest</u>
      Buy 100 contracts, Display Price: $2.65, Book Price: $2.70, Limit Price: $2.70
ABBO $2.50 (10) x $2.70 (10)
NBBO $2.65 (100 contracts) x $2.70 (10 contracts)

**Example #3.b      Multiple Re-Booking**

**Rule 515(d)(2)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $2.65 (100) x $2.75 (10)
    <u>Post-Only interest</u>
    Buy 100 contracts, Display Price: $2.65, Book Price: $2.70, Limit Price: $2.70
ABBO $2.50 (10) x $2.70 (10)
NBBO $2.65 (100 contracts) x $2.70 (10 contracts)

    *(i)    **The interest at $2.70 on the away market is executed and the new best offer to sell on the away exchange is $2.80.***

    1. The System will manage the Post-Only interest under the Managed Interest Process for Non-Routable Orders in Rule 515(d)(2)(iv) and will give the order a new timestamp and re-book the Post-Only Order at its limit price and re-display the order at its limit price.

    2. The Post-Only Order to Buy 100 contracts has a book price of $2.70 and a display price of $2.70.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $2.70 (100) x $2.75 (10)
    <u>Post-Only interest</u>
    Buy 100 contracts, Display Price: $2.70, Book Price: $2.70, Limit Price: $2.70
ABBO $2.50 (10) x $2.80 (10)
NBBO $2.70 (100 contracts) x $2.75 (10 contracts)

    3. The Post-Only Order to Buy 100 contracts is booked and displayed at is original and full limit price of $2.70 which is the most aggressive permissible price.

**Example #4**         **Managed Interest vs. Incoming Post-Only Interest**

**Rule 515(d)(2)**

<u>Current Market in XYZ August 50 Calls</u>

(MPV $.01)

PBBO $1.08 (10) x $1.15 (10)
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.09 (10 contracts) x $1.11 (10 contracts)

      *(i)*        ***The Exchange receives a non-routable order.***

Incoming order marked Do Not Route ("DNR") (not Post-Only) arrives in the System: **Buy 20 XYZ August 50 Calls at $1.13**

1. The System will manage the order under Rule 515(d)(2)(ii) as the limit price of the order crosses the current opposite side NBBO. The System will display the order one MPV away from the current opposite side NBBO and book the order at a price that will lock the current opposite side NBBO.

2. The DNR order to Buy 20 contracts has a book price of $1.11 and a display price of $1.10.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.10 (20) x $1.15 (10)
      <u>DNR Order</u>
      Buy 20 contracts, Display Price: $1.10, Book Price: $1.11, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (20 contracts) x $1.11 (10 contracts)

**Example #4.a**       **Managed Interest vs. Incoming Post-Only Interest**

**Rule 515(d)(2)**

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.10 (20) x $1.15 (10)
 <u>DNR order</u>
 Buy 20 contracts, Display Price: $1.10, Book Price: $1.11, Limit Price: $1.13
ABBO $1.09 (10) x $1.11 (10)
NBBO $1.10 (20 contracts) x $1.11 (10 contracts)

Incoming Post-Only Order arrives in the System: **Sell 5 XYZ August 50 Calls at $1.11**

1. Since the Post-Only Order cannot immediately execute by removing the managed interest of the buy order booked at $1.11, the System will reject the order under Rule 515(d)(2)(iii)(B).

*(i)*   ***The offer side of the NBBO fades from $1.11 to $1.15***

2. The limit price of the DNR no longer locks or crosses the market.

3. The System will give the order a new timestamp and book and display the order at its original full limit price under Rule 515(d)(2)(iv).

4. The DNR order to Buy 20 contracts has a book price of $1.13 and a display price of $1.13.

<u>Current Market in XYZ August 50 Calls</u>

PBBO $1.13 (20) x $1.15 (10)
 <u>DNR order</u>
 Buy 20 contracts, Display Price: $1.13, Book Price: $1.13, Limit Price: $1.13
ABBO $1.09 (10) x $1.15 (10)
NBBO $1.13 (20 contracts) x $1.15 (20 contracts)

***Orders for Own or Customer Accounts.*** In executing orders submitted to the Exchange's Book, the Exchange will not distinguish between orders submitted by Members for their own accounts and orders submitted by Members for their customers. All Exchange Members will submit orders to the Exchange from remote locations and have equal access to orders residing on the Exchange. Similarly, because orders on the Exchange will be executed automatically, no Member of the Exchange will have the ability to control the timing of execution (other than to change or cancel an order prior to execution).

***ISOs.*** The Exchange will accept Intermarket Sweep Orders ("ISO") in accordance with the Options Order Protection and Locked/Crossed Market Plan. ISOs are executed by the trading System without respect to the protected quotations of other exchanges, that is, the Options Order Protection and Locked/Crossed Market Plan and the proposed Exchange Rules provide an exemption to the prohibition on trading-through the NBBO for orders identified as ISOs, provided the Member submitting the ISO has complied with all aspects of the Plan and the Exchange Rules. It should be noted, executions of ISOs on the Exchange will be handled in accordance with the Exchange Rules governing the allocation among participants to the execution.

***Obvious or Catastrophic Errors.*** The Exchange will have a policy that will permit it to address those instances in which transactions occurring on the Exchange involve obvious or catastrophic errors. Proposed Exchange Rule 521 describes this error policy. The Exchange proposes to permit the Exchange to either bust a transaction or adjust the execution price of a transaction that results from an obvious error. Under the Obvious Error Procedure in proposed Rule 521(c), if a Member believes an executed order was the result of an Obvious Error it must notify the MIAX PEARL Regulatory Control. The Exchange will review the transaction to determine whether, in fact, the transaction was the result of an Obvious Error, and either bust or adjust the trade based on the objective criteria set forth in the rule.

Similarly, under the Catastrophic Error Procedure in proposed Rule 521(d), if a Member believes it has participated in a transaction that qualifies as a Catastrophic Error as defined in proposed Rule 521(d)(1), the Member must notify the MIAX PEARL Regulatory Control. The Exchange will review the transaction to determine whether, in fact, the transaction qualifies as a Catastrophic Error, and either bust or adjust the trade based on the objective criteria set forth in the rule.

The Exchange will also coordinate with other options exchanges in cases involving Significant Market Events across multiple exchanges under proposed Rule 521(e). If it is determined that a Significant Market Event has occurred then the Exchange will determine whether any or all transactions under review qualify as Obvious Errors, and either bust or adjust the trades based on the objective criteria set forth in the rule. If adjustment is not feasible due to the extraordinary nature of the situation, the Exchange will bust some or all transactions arising out of the Significant Market Event during the review period. All determinations made pursuant to this provision will be final.

The Exchange will also have procedures to address erroneous trades due to disruptions and/or malfunctions of Exchange systems as described in proposed Exchange Rule 521(k).

***Routing to Other Market Centers.*** The Exchange intends to become a participant in the Options Order Protection and Locked/Crossed Market Plan ("Plan"). In accordance with the Plan, the Exchange will provide price protection in options as set forth in proposed Rule 529.

The Route Mechanism described in proposed Rule 529(b)(1) will be used after the Exchange's Opening Process under Exchange Rule 503 has been completed. Routing will be used when an Eligible Order is received and/or reevaluated that is both routable and marketable against the opposite side ABBO upon receipt and the Exchange's disseminated market is not equal to the opposite side ABBO, or is equal to the opposite side ABBO and of insufficient size to satisfy the order.  The term Eligible Order is used in proposed Rule 529 to refer to the Eligible Order being handled by the Route Mechanism.  Eligible Orders are defined as: all Public Customer Orders received via the FIX Interface other than Intermarket Sweep Order ("ISO"), as defined in Exchange Rule 516(f), Do Not Route ("DNR") orders as defined in Exchange Rule 516(g) and Post-Only Orders as defined in Exchange Rule 516(j), all of which are not eligible to be routed. Orders received via the MEO Interface will not be routed and will be handled as set forth in Exchange Rule 515.  Eligible Orders resting on the Book may be routed with an incoming Eligible Order that has initiated a Route Mechanism.

Proposed Rule 529(b)(2) provides that an Eligible Order may be routed if the displayed NBBO was locked or crossed upon receipt of the Eligible Order.  If at the time of receipt of the Eligible Order, the opposite side ABBO is also locking or crossing the same side PBBO, the System will immediately route the Eligible Order, together with any routable interest resting on the same side PBBO, to the opposite side ABBO.  The Eligible Order and any routable resting interest will be processed in the order in which they were received. The System will route ISO orders representing Eligible Orders to away markets disseminating prices better than the Exchange's disseminated market.  The routed order will be priced at the ABBO with a size equal to each ABBO exchange's disseminated size.  If there are still additional contracts to be executed from the Eligible Order after the order has been routed to all away markets disseminating the ABBO for the away markets' full size, the System will handle remaining contracts from the Eligible Order in accordance with the provisions of Exchange Rule 515.

As set forth in proposed Rule 529(a), the Exchange will route orders to the other options exchanges through unaffiliated brokers.  The Exchange will determine the logic that provides when, how and where intermarket sweep orders are routed away to other options exchanges. The routing broker will receive instructions from the Exchange to route orders to other options exchanges and report the executions back to the Exchange. The routing broker cannot change the terms of an order or the routing instructions, nor does the routing broker have any discretion about where to route an order.

***Trade Reporting***.  The Exchange intends to become a member in the Options Price Reporting Authority Plan ("OPRA Plan") and will collect and submit to OPRA the best buy and sell interest displayed on the Exchange and report trades to OPRA in accordance with the terms of the OPRA Plan.  The Exchange also proposes to provide to subscribers of its proprietary data feeds, top of the market information and data pertaining to options contracts traded on the Exchange.

***Clearance and Settlement of Exchange Trades***. The Exchange will report matched trades to the Options Clearing Corporation.  The Exchange will require each Member to be a Member of a registered clearing agency or clear its transactions through a Member that is a member of a registered clearing agency.  The Exchange will also require each Member, for every transaction in which it participates, to immediately give up the name of the Clearing Member through whom the transaction will be cleared. If there is a subsequent change in identity of the Clearing Member, the Member must, as promptly as possible, report such change to the Exchange.

### E. Participation in Industry Programs

***Penny Pilot.*** Proposed Rule 510, Interpretations and Policies .01, sets out that the Exchange will operate a pilot program to permit certain options classes to be quoted and traded in increments as low as $.01 through December 31, 2016 (the "Penny Pilot Program"). The Exchange may replace, on a semi-annual basis, any Penny Pilot Program classes that have been delisted. The replacement classes will be selected based on prior trading activity over a six month period. The Exchange will distribute an Information Circular notifying Members of replacement classes to be included in the Penny Pilot Program.

***LULD Obvious Error Pilot.*** Proposed Rule 521, Interpretations and Policies .01, establishes a pilot program to coincide with the pilot period for the Plan to Address Extraordinary Market Volatility Pursuant to Rule 608 of Regulation NMS under the Exchange Act (the "Limit Up-Limit Down Plan"), including any extensions to the Limit Up-Limit Down Plan, to exclude transactions executed during a Limit State or Straddle State from the obvious error provisions of proposed Rule 521. The Exchange agrees to submit monthly data regarding the program. In addition, the Exchange agrees to submit an overall analysis of the pilot in conjunction with the data submitted under the Plan and any other data as requested by the Commission. Capitalized terms used herein, but not defined shall have the meanings set forth in the Exchange Rules.

In particular, each month, the Exchange shall provide to the Commission, and the public, a dataset containing the data for each Straddle and Limit State in optionable stocks that had at least one trade on the Exchange. For each trade on the Exchange, the Exchange will provide (a) the stock symbol, option symbol, time at the start of the Straddle or Limit State, an indicator for whether it is a Straddle or Limit State, and (b) for the trades on the Exchange, the executed volume, time-weighted quoted bid-ask spread, time-weighted average quoted depth at the bid, time-weighted average quoted depth at the offer, high execution price, low execution price, number of trades for which a request for review for error was received during Straddle and Limit States, an indicator variable for whether those options outlined above have a price change exceeding 30% during the underlying stock's Limit or Straddle State compared to the last available option price as reported by OPRA before the start of the Limit or Straddle State (1 if observe 30% and 0 otherwise), and another indicator variable for whether the option price within five minutes of the underlying stock leaving the Limit or Straddle State (or halt if applicable) is 30% away from the price before the start of the Limit or Straddle State.

In addition, the Exchange will provide to the Commission, and the public, no later than November 21, 2016, assessments relating to the impact of the operation of the obvious error rules during Limit and Straddle States including: (1) an evaluation of the statistical and economic impact of Limit and Straddle States on liquidity and market quality in the options markets, and (2) an assessment of whether the lack of obvious error rules in effect during the Straddle and Limit States are problematic. This data will be submitted under separate cover. Confidential treatment under the Freedom of Information Act is requested regarding the analysis.

***Pilot Programs Incorporated by Reference.*** MIAX PEARL further represents that it will provide the Commission with the same data that MIAX Options has agreed to provide with respect to any pilot program conducted on the Exchange that is based on MIAX PEARL Rules that are incorporated by reference to the Rules of MIAX Options. For example, proposed Rule 404, Interpretations and Policies .01, and proposed Rule 404, Interpretations and Policies .01,

establish a pilot program that eliminates position and exercise limits for physically-settled options on the SPDR S&P ETF Trust through July 12, 2017 ("SPY Pilot Program"). As this pilot program will be conducted on MIAX PEARL pursuant to Rules incorporated by reference to MIAX Options Rules, the Exchange will provide the same data to the Commission with respect to trading on MIAX PEARL as is currently provided by MIAX Options with respect to trading on that exchange.

In particular, the Exchange represents that it will submit a Pilot Report at least thirty (30) days before the end of the pilot period ending July 12, 2017. The Pilot Report will detail the size and different types of strategies employed with respect to positions established as a result of the elimination of position limits in SPY. In addition, the Pilot Report will note whether any problems resulted due to the no limit approach and any other information that may be useful in evaluating the effectiveness of the SPY Pilot Program. The Pilot Report will compare the impact of the SPY Pilot Program, if any, on the volumes of SPY options and the volatility in the price of the underlying SPY shares, particularly at expiration. In preparing the report the Exchange will utilize various data elements such as volume and open interest. In addition the Exchange will make available to Commission staff data elements relating to the effectiveness of the SPY Pilot Program.

## F.     Exchange Fees (#4)

***Fees Generally***. In accordance with proposed Rule 1203 (which is incorporated by reference to Rule 1203 of MIAX Options), the Exchange may prescribe such reasonable fees, and assessments or other charges as it may deem appropriate and as consistent with Section 6(b) of the Exchange Act. The Exchange intends to establish a Fee Schedule, which will be filed by the Exchange pursuant to Section 19 of the Exchange Act and Rule 19b-4 thereunder setting forth all applicable transaction and other fees. Actual fee amounts and types will not be determined until close to launch of Exchange operations because the fees and how they are applied will need to reflect the competitive landscape at that time.

The Exchange may also charge membership fees, application fees, market data fees, connectivity fees, and bandwidth fees. Exchange Members will be solely responsible for all telecommunications costs and all other expenses incurred in linking to, and maintaining links to, the Exchange. The Exchange may determine to revise or impose different fees upon its Members and Sponsoring Members from time-to-time.

## G.     Procedures for Ensuring Compliance with Exchange Usage Guidelines (#5)

The Exchange System contains embedded order entry and trade guidelines. All data representing an order must comply with these guidelines. Members cannot override these embedded guidelines. With respect to technical standards, prior to allowing a new Member to begin trading, the Exchange and the Member will thoroughly test the Member's connectivity. In addition, the Member may enter orders in test securities to ensure compatibility with the Exchange's System protocol. A Member may begin trading only after the Member and the Exchange are satisfied that both the Member's hardware and software meet the Exchange's standards.

Members also must agree to maintain an adequate connection to the Exchange as defined from time-to-time by the Exchange that includes a connection of sufficient speed and equipment of minimum quality.

**H.     Hours of Operation and Proposed Commencement of the Exchange (#6)**

The Exchange proposes to operate Monday to Friday from 9:30 a.m. Eastern Time to 4:00 p.m. Eastern Time, except the Exchange may remain open for trading option contracts on Exchange Traded Fund Shares and Index-Linked Securities beyond 4:00 p.m. but in no case later than 4:15 p.m. Eastern Time.  In addition, the Exchange may operate during any other day or time approved by the Board of Directors of the Exchange.

The Exchange proposes to commence operations upon the approval of its Form 1 Application for Registration as a National Securities Exchange by the Securities and Exchange Commission (the "Commission") and subject to approval of all necessary regulatory and National Market System plans, including the Plan for Reporting of Consolidated Options Last Sale Reports and Quotation Information (i.e., the Options Price Reporting Authority ("OPRA")), and subject to the Exchange joining The Options Clearing Corporation, or OCC.

**I.     Exchange Users' Manual (#7)**

As discussed above, Members will be provided with the Exchange's technical specifications, which will enable them to develop or purchase their own, customized front-end software for interfacing with the Exchange. Members also may use third-party vendors to route orders to the Exchange via a front end or service bureau configuration.  The Exchange will make available on the internet to prospective Members all necessary connectivity documentation. A draft Users' Manual that will be provided to all Members and prospective Members of the Exchange is included with this Exhibit E.  The draft Users' Manual describes the Exchange's technical specifications and provides Members, prospective Members and other users of the Exchange with additional information that the Exchange believes will be useful to such persons for trading on the Exchange.

**J.     Possession of Funds or Securities (#8)**

The Exchange will not hold funds or securities of its Members.

# USER'S MANUAL

(REVISION DATE: AUGUST 10, 2016)

# Table of Contents

**Introduction**

MIAX PEARL (MIAX PEARL, PEARL or the Exchange) created this User's Manual to assist Members and users of its Exchange in understanding the operation of the Exchange.  The User's Manual discusses, and in some cases, summarizes various MIAX PEARL Rules.  MIAX PEARL's complete and official Rulebook is available at http://miaxoptions.com/_____.  In the event of a conflict between the User's Manual and the Rules set forth in the official Rulebook, the Rulebook shall prevail.

MIAX PEARL operates a fully automated electronic options trading platform for the purpose of buying and selling securities with a continuous, automated matching function.  Liquidity is derived from orders to buy and sell.  Orders are submitted to the Exchange electronically by Members from remote locations.  PEARL does not maintain a physical trading floor.  There are two categories of Members on PEARL – Market Makers, and all other Members which are known as Electronic Exchange Members (EEMs).

Access to the Exchange is maintained by way of Trading Permits issued to the Members. Trading Permits are not transferable except in the event of a change in control of a Member.

Members are subject to fees for executions and services on the Exchange as set forth in the Exchange's Fee Schedule.

# 1. How to Become a Member of MIAX PEARL

**How to become a member of MIAX PEARL**

*Holders of MIAX Options Exchange Trading Permits*. A holder of a MIAX Options Exchange Trading Permit in good standing is eligible to receive one PEARL Trading Permit.  A holder of a MIAX Options Exchange Trading Permit who wishes to apply to the Exchange is not required to complete and submit an Exchange application. Instead, only Exchange forms concerning election to trade on the Exchange, submitting to Exchange jurisdiction, and operational matters need to be completed and tendered.

*Firms that are not holders of MIAX Options Exchange Trading Permits*.  A prospective member firm must be registered as a broker-dealer, must be a member of at least one other registered options exchange or FINRA, must be able to clear option trades or must clear through a clearing firm and must meet certain additional criteria described by the Exchange and set forth in the Exchange's Rules.

Further information on membership at MIAX PEARL, is available on the Exchange's website: http://miaxoptions.com/          .

# 2. Types of Membership

**Market Makers**

To register as a Market Maker, a Member must file an application in writing on such forms as the Exchange may prescribe. The Exchange reviews applications and considers an applicant's market making ability and such other factors as the Exchange deems appropriate in determining whether to approve an applicant's registration as a Market Maker.

Each registered Market Maker must appoint a qualified person to act as a "Market Maker Authorized Trader" or "MMAT".  An MMAT is an authorized trader who performs market making activities and fulfills market making responsibilities on behalf of the Market Maker.

**Electronic Exchange Members (EEM)**

An EEM is an Exchange Member representing as agent Public Customer Orders or Non-Customer Orders on the Exchange and those non-Market Maker Members conducting proprietary trading.

## 3.  Access by Non-Members

Non-Members may access the Exchange pursuant to Rules governing "sponsored access" to the Exchange.  The Exchange permits access by entities (Sponsored Users) whose access is authorized in advance by entering into an arrangement with a Member (Sponsoring Member) in accordance with Exchange Rules.

Sponsored Users must agree to comply with all applicable Rules of the Exchange governing the entry, execution, reporting, clearing and settling of orders in securities eligible for trading on the Exchange.  Further information about Sponsored Access can be found in MIAX PEARL Rules, Chapter II.

## 4.  How MIAX PEARL Works

**Architecture**

Market Makers and EEMs can send orders to the Exchange's System through the MIAX PEARL Express Order Interface (MEO) or the PEARL FIX Order Interface (FOI) gateway.  The MIAX PEARL Trading System is designed to be highly scalable, efficient, fast, reliable, robust and flexible.

The Exchange deploys multiple matching engines, each engine performing the trade match function for a defined set of option classes.

Market Makers and EEMs may connect to the System via the MIAX PEARL Express Order Interface (MEO) using a proprietary binary protocol for the transmission of orders and other messages to and from the Exchange.  Two types of MEO ports are available:

- Full Service MEO Port
  - All input message types are supported
- Limited Service MEO Port
  - Supports all message types except bulk orders

A firm may be allocated up to two full service and up to four limited service MEO connections for each Exchange matching engine.  Participants utilizing the binary MEO Interface are required to connect separately to each matching engine as the Exchange offers no routing capability via this interface.

In addition to MEO, Market Makers and EEMs may also connect to the System via the PEARL FIX Order Interface (FOI) gateway using the industry standard FIX protocol with PEARL specific extensions for the transmission of orders and other messages to and from the Exchange.  The

PEARL FOI validates incoming orders and forwards them to the appropriate matching engine. Executions and cancelation notifications are provided through these same interfaces.

The matching engines of the Exchange each handle a defined set of option classes, which may be reallocated on a periodic basis in order to ensure that system load is balanced across the PEARL System.  Each matching engine compares the price of all incoming orders with those orders already resting on the PEARL Book.  The matching engine matches liquidity as available, calculates the PEARL Best Bid and Best Offer (the PBBO), monitors the other markets' displayed prices and determines when, and if, a trade can occur.  If a newly arrived order is marketable against the existing PEARL Book, and the PBBO is equal to or better than the best consolidated quote, an immediate match is made and allocations are communicated back to the trade participants.

If another market is disseminating a price superior to PEARL's displayed price, orders may be routed to the better priced market(s).  Orders may be managed within the PEARL System so as not to lock the prices displayed on other markets.

**Network Infrastructure**

The MIAX PEARL network was designed to complement the PEARL Trading System and was built from the ground up to address the performance and security needs of a high speed trading platform.  The MIAX PEARL network infrastructure utilizes fully diverse and redundant 40Gbps backbones and 10/40Gbps switch technology for maximum throughput and minimal latency.

**Data Center Services**

- MIAX PEARL has partnered with Equinix, a world-class provider of data center services, to host the Trading System's data center infrastructure in its NY4 location.
- Customers with very low latency demands can cross-connect to the MIAX PEARL System from elsewhere within the Equinix facility.  MIAX PEARL cross-connects are latency equalized to ensure each participant's cross-connect is the same physical distance from the MIAX PEARL System regardless of their location in the Equinix facility.
- Notable Data Center Services
    - SSAE16 compliant Data Centers
    - Redundant power feed sourced from district substations
    - Redundant power and cooling distribution paths within the facility
    - Concurrently maintainable (N+1 for greater resiliency)
    - On-site backup power generation
- Enhanced Security Services
    - State of the art security
    - Hand Scanners
    - Card Readers
    - Cameras

- Buildings designed to withstand fires, earthquakes, hurricanes and other environmental threats.
- Manned 24/7.
- A second Data Center is located in Chicago (CH4) for Disaster Recovery.

**Connectivity Choices**

- PEARL offers truly diverse, redundant 1 Gigabit, 10 Gigabit and 10 Gigabit ULL connectivity options in data center facilities and supports direct attachment of customer/provider network equipment or direct attached host systems.  Users are strongly encouraged to establish dual connections to the primary facility in NY4 and connection to the disaster recovery system located in Chicago (CH4) to minimize the possibility of service disruption.  Certain Members of MIAX PEARL will have mandatory participation requirements in the Exchange's annual Disaster Recovery (DR) test and will therefore be required to establish a connection to the disaster recovery system located in Chicago (CH4). PEARL supports the following connectivity options:
    - Cross-Connect: Users that are co-located in the Equinix NY4 data center may request an in-house cross-connect from the User's Point of Entry (POE) to PEARL.
    - Point-to-point: Users may connect point-to-point using leased lines or other network methods (e.g. Ethernet, etc.).  (Users are responsible for providing colocation space for independently owned equipment.)
    - Metro Ethernet/Dark Fiber:  Users may connect via Metro Ethernet or a dark fiber provider.

**Trading System Features**

- The MIAX PEARL Trading System was developed specifically for the unique functional and performance demands of derivatives trading. The System provides the proper protections, low latency and high throughput that is essential to the success of the trading community.  The MIAX PEARL System provides extreme performance and scalability with best in class customer interface features and performance.
- MIAX PEARL FIX Order Interface (FOI) gateway for orders.
    - Each FOI is capable of processing more than 7,700 order messages per second.
- MIAX PEARL FIX Drop (FXD)
    - For clearing trade drops normally sent over FIX.
    - Available only to submitting EEMs
    - Echoes trade fills, trade adjustments, trade corrections and trade cancellations from orders submitted via FIX
    - Does not include other FIX information such as order cancellations or order adjustments.
    - Multiple MPIDs can be configured to use a single FIX Drop Interface

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- MIAX PEARL Express Order Interface (MEO) offers direct connections to the matching engine for the high-speed mass messaging of orders.
  - Each full service MEO Interface is capable of processing more than 200,000 orders per second.
- MIAX PEARL Top of Market (ToM) provides low latency access to PEARL market data.
  - The PEARL ToM data feed service produces market data across 12 multicast channels. Each channel is capable of transmitting more than 1,200,000 messages per second during peak periods.
- MIAX PEARL Clearing Trade Drop (CTD) is a low-latency, real-time feed providing clearing trade information to the parties of a trade, Clearing Firms and/or other entitled designated recipients. Recipients connect to the CTD using a proprietary protocol and one or more CTD connections for each Exchange matching engine.
  - The PEARL CTD interface is capable of processing more than 20,000 clearing trade messages per second.
- MIAX PEARL Liquidity Feed (PLF) provides information about orders in the PEARL markets over a multicast feed.
- The MIAX PEARL System uses a next-generation highly-automated Quality Assurance platform that runs a full battery of tests against the System every night to ensure a high level of reliability and unprecedented confidence in System updates.
  - State-of-the-art monitoring and systems security.
  - A software and hardware architecture that results in minimizing the demands on power, space and cooling while allowing for rapid scalability, standard setting resiliency and superior fault isolation.

Further information on the Top of Market feed and the MIAX PEARL Liquidity Feed is listed below. For additional details about connecting to the PEARL trading platform, please see the Interface Connectivity Specifications on the PEARL website: http://miaxoptions.com/_____.

**Top of Market (ToM)**

Top of Book and Trade Data is made available over the MIAX PEARL Top of Market data feed (ToM). ToM is available to all PEARL participants. ToM specific information:
- PEARL Best Bid and Offer information with sizes
- Indications of Public and Priority Customer at the PBBO
  - When present, the size of the Priority Customer interest is also indicated
- Last sale information
- Post-Halt Notifications

ToM also includes information about other real-time Exchange System functions. Recipients connect to ToM using a proprietary protocol and for the purpose of redundancy may subscribe to two identical connections (ToM "A" and ToM "B") for each Exchange matching engine.

**MIAX PEARL Liquidity Feed (PLF)**

The PEARL Liquidity Feed provides information about orders on the PEARL order book over a multicast feed.

The following updates are transmitted over PLF when an order is received or when an order state changes.
- Published Order information
    - Time stamp
    - Action
    - Product ID
    - Order ID
    - Order Side
    - Order Type
    - Order Price
    - Original Order Size
    - Open Order Size
    - Time in Force
    - Origin
    - Open or Close
    - Route Instruction
- The following will not be disseminated
    - Order States
        - Pending Replace
        - Rejected
    - Order with time in Force of
        - IOC
    - Child orders related to routing are not published

**MIAX PEARL Information and Performance Reports**

MIAX PEARL Information and Performance Reports provide Member Firms with details of their trading and activities on the Exchange. Reports include key information about transaction fees, marketing fees, the NBBO and PBBO at the time of transaction, as well as volume, clearing and risk information. This information is intended to assist firms in monitoring and evaluating their trading activity on MIAX PEARL.

Further information on the availability of MIAX PEARL Information and Performance Reports can be obtained by contacting MIAX PEARL Trade Operations at: TradingOperations@MIAXOptions.com.

**Classes Listed on MIAX PEARL**

A complete list of all Option Classes traded on PEARL is maintained in the Listings section of the Exchange's website at this address: http://miaxoptions.com/_____ .

The All Classes Listed on PEARL file is updated daily and is available in CSV format.  The file contains detailed information on each Class including:

- Underlying Symbol
- Underlying Security Name
- Option Symbol
- Minimum Price Variation
- Closing Time
- Information on Expiration Programs
- Information on Price Programs
- An indication if the Class is Closing Only
- PEARL Cloud Number (equivalent to Matching Engine Number)

**Options Listed on MIAX PEARL**

A complete list of all Options traded on PEARL is maintained in the Listings section of the Exchange's website at this address: http://miaxoptions.com/_____ .

The All Options Listed on PEARL file is updated daily and is available in CSV format.  The file contains detailed information on each listed Option including:

- Underlying Symbol
- Option Symbol
- Expiration Date
- Strike Price
- Deliverable
- An indication if the Option is Closing Only

# 5.  Order Information

**Order Types**

The following are some of the order types described in the MIAX PEARL Rules that, except as may be described below, are available for use on the Exchange as of the date of this Manual:

- Market – An order to buy or sell a stated number of options contracts at the best price available at the time of execution.
- Limit – An order to buy or sell a stated number of options contracts at or better than a specified price.

- Immediate-or-Cancel (IOC) – An order to be executed in whole or part upon receipt with any unexecuted portion cancelled. An Immediate-or-Cancel order is not valid during the opening rotation process described in Rule 503.
- Intermarket Sweep Order (ISO) – A limit order designated by the submitting member as an ISO trades without regard to PEARL price protections or protected quotations on other markets.
- Do Not Route (DNR) – An order that will never be routed outside of the PEARL regardless of the prices displayed by away markets. A DNR order will never execute at a price inferior to the NBBO and when necessary, its display price will be managed so as not to lock or cross the NBBO.
- Day Limit – An order to buy or sell which, if not executed, expires at the end of trading in the security on the day on which it was entered.
- Good 'Til Cancelled (GTC) – An order to buy or sell, which if not executed, remains in effect until cancelled or until the underlying option expires.
- Cancel-Replacement Order. A Cancel-replacement order is a single message for the immediate cancellation of a previously received order and the replacement of that order with a new order with new terms and conditions.
- Post Only Order. Post-Only Orders are orders that will not remove liquidity from the Book. Post-Only Orders are to be ranked and executed on the Exchange pursuant to Rule 514 (Priority on the Exchange), or handled pursuant to Rule 515, as appropriate, and will never route away to another trading center.
- Marketable Limit Order. A marketable limit order is a limit order to buy (sell) at or above (below) the best offer (bid) on the Exchange.

Each of these types of orders is described in detail in MIAX PEARL Rule 516. The Exchange maintains a full audit trail of every order submitted to the Exchange's System. Members may receive status reports regarding orders submitted to the Exchange or change or cancel an order at any time before that order is executed on the Exchange.

**Routing to Other Exchanges**

Routing services are provided for routing to all Options Exchanges in the United States and are fully compliant with the Options Locked and Crossed Markets Plan (the Plan). The PEARL System routes Public Customer Orders received via the FIX Order Interface (FOI) to away markets displaying liquidity at the NBBO when required to satisfy a protected quotation under the Plan. Orders received through MEO are not eligible for routing by the PEARL System and will be managed if locking or crossing the NBBO.

A full description of PEARL routing functionality is available in MIAX PEARL Rule 529.

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**Order Protections Based on Size and Quantity**

The MIAX PEARL System offers protections from potentially erroneous executions or obvious errors based on the size of orders, number of open orders and number of open contracts.

Members are required to submit global default settings for their firm as a part of the PEARL Membership Application process for all protections based on size or quantity.

Firms may provide updated settings by contacting the PEARL Trade Operations staff.  The most recent settings will remain effective in the PEARL System until a subsequent update is received by the Exchange.  All settings are put in place on a firm-wide basis and are not individually selectable by FOI connection or MPID. The following protections are available:
- Maximum size for a single order.
- Maximum number of open orders.
    - This includes partially filled orders.
- Maximum number of open contracts.
    - This includes any contracts remaining from unfilled and partially filled orders.

**Interfaces and Liquidity Types**

PEARL has both a FIX Order Interface (FOI) and MIAX PEARL Express Orders Interface (MEO).  The FOI allows standard orders in FIX format. The MEO Interface allows the submission of Cancel-Replacement orders or Standard orders in a binary format. A Cancel-Replacement order replaces an existing order for a given MPID on the same product and side. A Standard order is always treated as a new order and does not cancel or replace any existing order. A Standard order can be canceled or replaced using the respective message types.

A bulk order packet can contain one or more Cancel-Replacement orders, Standard orders, Standard order cancels or Standard order replacements. The maximum number of such orders in a packet is conveyed in the MEO Interface specification http://miaxoptions.com/_____.

**Quoting Requirements**

Further information regarding order submission requirements for Market Makers can be found in MIAX PEARL Rules 604 and 605 and on the Exchange's website: http://miaxoptions.com/_____.

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## 6. Trading on MIAX PEARL

**Penny Pilot Program**

PEARL participates in the Penny Pilot program, which provides for the quoting and trading of certain option classes in penny increments.  A list of the classes participating in the Penny Pilot Program is available along with other listing information on the Exchange's website at this address:  http://miaxoptions.com/      .

**Minimum Trading and Pricing Increments on MIAX PEARL**

Options in classes not in the Penny Pilot Program have a Minimum Price Variation (MPV) for PBBO display in $0.05 increments if the affected series has a price of under $3.00,  and in $0.10 increments if the affected series has a price of $3.00 or higher.

Options in classes in the Penny Pilot Program have an MPV for PBBO display in $0.01 increments under $3.00 and $0.05 increments for prices of $3.00 or greater. Options overlying the PowerShares QQQ™ ("QQQ"), SPDR® S&P 500® ETF ("SPY"), and iShares® Russell 2000 ETF (IWM), however, are quoted and traded in minimum increments of $0.01 for all series regardless of the price.

**Allocation of Trades**

PEARL supports price-time trade allocation. Within each price level, if there are two or more orders at the best price, trading interest will be executed in time priority.

**MIAX PEARL Opening Process**

The PEARL Opening Process begins when the quoting requirements and other provisions of MIAX PEARL Rule 503(b)(1) have been satisfied.

Once the Opening Process begins, if there are no orders that lock or cross each other, the System will open by disseminating the Exchange's best bid and offer among orders that exist in the System at that time.  If there are orders that lock or cross each other for a particular option series, the System will determine a single price at which such option series will be opened (the "Opening Price"). Under MIAX PEARL Rule 503(b)(2)(i) the Opening Price of a series will be the midpoint of the Valid Width NBBO, and will be rounded up if necessary to achieve a proper MPV.

After establishing an Opening Price, orders in the System that are priced equal to or more aggressively than the Opening Price will be matched based on price-time priority. Matches will occur until there is no remaining volume or there is an imbalance of orders. All orders or portions thereof that are matched pursuant to the Opening Process will be executed at the

Opening Price. An imbalance of orders on the buy side or sell side may result in orders that are not executed in whole or in part. Such orders will be handled in time sequence, beginning with the order with the oldest time stamp and may, in whole or in part, be placed on the MIAX PEARL Book, cancelled, executed, or routed in accordance with MIAX PEARL Rule 529.

After all possible interest has been traded at the Opening Price, free trading will begin.  Any interest from the Opening that was priced equal to, or through, the Opening Price, along with any new interest received during the Opening, will be introduced into the System in sequence based upon the time of order receipt.

More information regarding Opening on the Exchange can be found in MIAX PEARL Rule 503.

**System Settings**

All current System settings are posted in the Regulatory Circulars located under the Regulatory tab on the Exchange's website: http://miaxoptions.com/          .  Changes to System settings are also published by the Exchange as either Regulatory Alerts or Regulatory Circulars, as required.  Please be sure to check the Exchange's website for the most current information.

**Trading Halts and Trading Pauses**

The System automatically halts trading when the primary market for the underlying security disseminates a halted or paused condition. Under certain circumstances, in the interest of a fair and orderly market, the Exchange may elect to manually halt trading in an individual option class, a group of option classes or all option classes Exchange wide.

The Opening Process will not begin if the underlying security is halted or paused. If the Opening Process is in progress at the time of the halt, the System will interrupt the Opening Process prior to its completion, will halt trading in options already opened and will prevent unopened options from opening.   After a trading halt on PEARL, the System will reopen following the same processes as the Opening Process, except that the Primary Listing Exchange for the underlying security will be used in place of the any other exchange that may have been designated as the PEARL Exchange for Opening.  The designated PEARL Exchange for Opening is disseminated via Regulatory Circular and is available on the Exchange's website.

Post Only orders that are on the Book will automatically be cancelled when trading in an option on a security has been halted.

Notifications Prior to Re-Opening:
- The Post Halt Notification period is the length of time prior to reopening after a <u>manual</u> trading halt prior to which a System notice is distributed over the Exchange's data feeds.
  - 20 Seconds.
- The Reopening Delay period is the length of time prior to reopening after an <u>automatic</u> trading halt (a System initiated interruption of trading resulting from a halt or pause in the

underlying security on its primary listing exchange) prior to which a System notice is distributed over the Exchange's data feeds.
- o 5 Seconds

**Limit Up/Limit Down (LULD)**

LULD functionality on PEARL is in effect when the underlying NMS Stock has entered into a Limit State or Straddle State.  Once an NMS Stock has entered either a Straddle State or Limit State:
- The Exchange will not open an affected option.
- If an LULD state is entered after the opening, the Exchange will:
  - o reject all incoming market orders submitted into the Exchange System, and
  - o cancel all unexecuted market orders existing within the Exchange System, except that market orders to sell an option received when the national best bid is zero and the Exchange's disseminated offer is equal to or less than $0.10 that have been converted to limit orders to sell pursuant to Rule 519(a) will not be cancelled by the Exchange's System.

In addition, once an NMS Stock has entered either a Limit or Straddle State, the Exchange shall relieve Exchange Market Makers from the following quotation obligations for options on the affected underlying NMS Stock:
- the minimum size requirement set forth in MIAX PEARL Rule 605(a)
- the requirement to submit two-sided quotes set forth in MIAX PEARL Rule 605(b); and
- the continuous quoting obligation set forth in MIAX PEARL Rule 605(d)

When an underlying NMS Stock is subject to a Trading Pause, the Exchange System will halt trading in options overlying the affected NMS Stock pursuant to MIAX PEARL Rule 504(c).

**Market Wide Circuit Breakers (MWCB)**

MWCB halts are treated by the System in the same fashion as a Regulatory Trading Halt on the Primary Listing Market.

# 7. MIAX PEARL Trade Protections

**MIAX PEARL Order Monitor (MOM)**

In order to reduce the incidence of potential obvious or catastrophic errors on the Exchange, the PEARL System includes the MIAX PEARL Order Monitor (MOM), as described in Exchange Rule 519.  The MIAX PEARL Order Monitor prevents certain orders that violate certain pre-defined price limits from executing or being placed on the PEARL Book.  These price protections include:

- Market orders to sell will be converted to limit orders to sell with a limit price of one Minimum Trading Increment when the national best bid is zero and the Exchange's disseminated offer is equal to or less than $0.10.
- Rejection of market orders to buy or sell when the NBBO is $5.00 wide or greater.
- Rejection of limit orders priced though the opposite side of the NBBO by the lesser of: a) 50% of the opposite side NBBO where the minimum crossing price is $0.25, or b) $2.50.

Protections under the MIAX PEARL Order Monitor do not apply to orders received prior to, or during the Opening Process, or to incoming orders marked as Intermarket Sweep Orders (ISO).

**MIAX PEARL Variable Price Protection (MVP)**

The System applies a price protection process, as described in MIAX PEARL Rule 515(c), to all orders (other than ISOs which are handled in accordance with subsection (f) of MIAX PEARL Rule 515), limiting executions to no more than a specified number of MPVs through the NBBO as captured at time of order receipt.  (If the ABBO is crossing the PBBO on the same side of the market as the incoming order at time of receipt, the PBBO price on the same side of the market will be used as the starting point for the MIAX PEARL Variable Price Protection process in place of the opposite side NBBO.)

If size remains from a limit order priced though the NBBO (at the time of receipt) by more than the specified number of MPVs or a market order, and the order has exhausted its ability to execute on the NBBO within the MVP limit, the balance of the order will be cancelled back to the submitting member.

The number of MPVs through the NBBO at the time of order receipt that the order will be allowed to execute may be specified in the order at the time it is submitted to the Exchange though the PEARL FIX Order Interface.  The acceptable value range for MIAX PEARL Variable Price Protection is:
- 0 to 20
    - A selection of 0 will indicate that the order will not be allowed to trade at a price inferior to the NBBO at the time the order was received

In the absence of a specified MVP value in the order at the time of submission, an Exchange default value for MVP will be applied.  The MVP Exchange default value is five (5) MPVs.

Orders that participate in the PEARL Opening Process will always use an MVP value of zero (0) regardless of whether another value has been specified in the order at the time of submission.

**MIAX PEARL Aggregate Risk Manager (ARM)**

The PEARL Aggregate Risk Manager (ARM) protects Market Makers and EEMs who choose to participate (collectively ARM Participants) by limiting the number of contracts executed for a submitting MPID as a result of orders entered through MEO in a single class within a brief period of time as described in Exchange Rules 517A and 517B.

PEARL ARM tracks the number of contracts traded by an ARM Participant (represented as a percentage of their bid or offer size) in an assigned option class within a specified time period. The ARM Participant establishes a percentage of the number of contracts that they are bidding for or offering (Allowable Engagement Percentage) and the time period for each option class. When an execution against an ARM Participant's ARM eligible order occurs, the System looks back over the specified time period to determine whether the execution is of sufficient size to trigger the Aggregate Risk Manager.

The System engages the Aggregate Risk Manager when it has determined that an ARM Participant has traded a number of contracts equal to or above their Allowable Engagement Percentage during the time period. The Aggregate Risk Manager then automatically cancels and removes the ARM Participant's orders from the Exchange's disseminated quotation in all series of that particular option class and rejects new orders by the ARM Participant in all series of that particular option class submitted using the MEO Interface until the ARM Participant sends an ARM Protection Reset Message and submits a new order in the affected class. Orders submitted through FIX are not counted or cancelled by the Aggregate Risk Manager.

**ARM$^2$**

ARM$^2$ is an enhancement to the existing ARM functionality.  ARM$^2$ further protects PEARL Market Maker firms with two additional ARM-derived counting programs, ARM$^2$ Class Protection and ARM$^2$ Firm Protection.
- ARM$^2$ Class Protection - ARM$^2$ Class Protection counts the number of ARM protections in a Class for a Market Maker MPID over an ARM$^2$ Counting Period specified by the firm. If the ARM$^2$ Class Protection Rate is met by a number of ARM Triggers in any Class, ARM$^2$ will trigger ARM$^2$ Class Protection for that MPID in the affected Class. ARM$^2$ Class Protection will prevent automated re-entry of MEO orders. Protections will remain until a manual re-enablement is accomplished by PEARL Trading Operations, allowing an ARM Protection Reset Message to be submitted.
- ARM$^2$ Firm Protection - ARM$^2$ Firm Protection counts the total number of unique Classes that trigger ARM for a firm over a Counting Period specified by the firm.  If the number of unique Classes that trigger Primary ARM meets or exceeds the ARM$^2$ Firm Protection Rate, ARM$^2$ will trigger Secondary ARM protection for all Classes for the Market Maker firm.  Secondary ARM protection will prevent the automated entry or re-entry of MEO orders. Protections will remain until a manual re-enablement is accomplished by PEARL Trading Operations allowing an ARM Protection Reset Message to be submitted.

            Revision Date: August 10, 2016

          ○   ARM$^2$ Market Maker Firm Protection applies to all of a Market Making firm's MPIDs across all classes
- Configuration of ARM$^2$ Settings
    - As with ARM settings, ARM$^2$ Class Protections are entered into the System via that MIAX PEARL Express Order Interface (MEO). Using MEO, the firm can at any time create, edit or delete:
        - The settings for how many Primary ARM protections are required to trigger ARM2 for any Class/MPID combination.
        - The Counting Period settings for any Class/MPID combination.
    - To create, edit or delete ARM$^2$ Firm Protections, the firm must submit a completed Protection Template to PEARL Trading Operations describing the ARM$^2$ Firm Protection settings desired including the following:
        - The total number of unique Classes that must be protected by ARM across all MPIDs in the firm required to trigger ARM2 Firm Protection
        - The Counting Period setting for ARM$^2$ Firm Protection

## MIAX PEARL Risk Protection Monitor (RPM)

The PEARL Risk Protection Monitor (RPM) is responsible for monitoring risk from the transmission and execution of an EEM's orders, submitted by a specific order interface (FOI or MEO), Exchange-wide. FIX RPM will operate separately from MEO RPM. When an order is received or an execution from an order occurs, RPM will look back over the specified time frame and calculate the number of orders or executed contracts for that firm on that interface. When the number of orders or executed contracts from orders for that firm on that interface exceeds a predetermined level, RPM will automatically trigger RPM Safeguards for the firm on that interface as described in Exchange Rules 519A and 519B.

All members who enter orders on the Exchange may establish basic risk protections for trading on PEARL.  A participating Member may establish specified time periods for both an Allowable Order Rate and an Allowable Contract Execution Rate.  The maximum duration of each specified time period will be established by the Exchange and announced via Regulatory Circular.

When a Member's order is entered, or when an execution of a Member's order occurs, the System will look back over the specified time period to determine whether the order entered or the execution that occurred triggers the Risk Protection Monitor.
- Members may establish whether the Risk Protection Monitor, when triggered, will:
    - prevent the System from receiving any new orders in all series in all classes from the Member; or
    - prevent the System from receiving any new orders in all series in all classes from the Member and cancel all existing Day orders in all series in all classes from the Member; or
    - send a notification that the Risk Protection Monitor has been triggered without any further preventative or cancellation action by the System.

RPM Groups

- Members may also elect to group with other Members to enable the Risk Protection Monitor to apply collectively to the Group. The Members in the Group must designate a Group owner. Members may elect to group provided that either:
    - there is at least 75% common ownership between the firms as reflected on each firm's Form BD, Schedule A; or
    - there is written authorization signed by all Members in the Group and the Group owner maintains exclusive control of all orders sent to the Exchange from each MPID within the Group.

- A clearing firm may also elect to group several Members to enable the Risk Protection Monitor to apply collectively to the Group with the clearing firm designated as the Group owner, provided that the clearing firm serves as the clearing firm for all the MPIDs of the Group and there is written authorization signed by the clearing firm and each Member of the Group. A clearing firm that has grouped several Members may only receive warning messages, unless one Member of the Group maintains exclusive control of all orders sent to the Exchange from each MPID within the Group.

- The Risk Protection Monitor for Groups will operate in the same manner as described above, except that: (i) the counting program will count the number of orders entered and the number of contracts traded resulting from an order entered by all MPIDs in the Group collectively; (ii) the System will trigger the Risk Protection Monitor when the Group collectively exceeds either the Allowable Order Rate or Allowable Contract Execution Rate for the Group; (iii) once engaged, the Risk Protection Monitor will then either automatically prevent the System from receiving any new orders in all series in all classes from each MPID in the Group, and, if designated by the Group owner's instructions, cancel all existing Day orders in all series in all classes from the Group or send a notification without any further preventative or cancellation action by the System; and (iv) only the designated Group owner may request the Exchange to enable the acceptance of new orders for all the Members of the Group.
    - Subject to the above, a Member may establish more than one Group.

RPM Warnings

- Members may also elect to receive warning notifications indicating that a specific percentage of an Allowable Order Rate or an Allowable Contract Execution Rate has been met for all metrics.

For further information on the configuration and operation of the Risk Protection Monitor, please contact PEARL Trading Operations: http://miaxoptions.com/            .

**FIX Auto Cancel on Disconnect Protection (FIX ACOD)**

FIX ACOD allows PEARL EEMs to limit their exposure during all losses of FIX connectivity other than PEARL induced losses by instructing PEARL to automatically cancel designated FIX orders upon a loss of connectivity with the PEARL FIX Order Interface (FOI).

FIX ACOD protection can be specified on a per-session (the PEARL System will automatically mark all new FIX orders received during that session for ACOD protection) or on a per-order basis. When operating on a per-order basis, the user will mark only those orders to be protected when the order is submitted to the Exchange though the PEARL FOI or the PEARL MEO.

GTC orders are not eligible for PEARL FIX ACOD protection and will not be cancelled when FIX ACOD protection is invoked, even if the order was marked for ACOD protection at the time of delivery or submitted during a session for which ACOD protection has been specified.

FIX ACOD protection is not invoked during a PEARL induced loss of connectivity. During a PEARL induced loss of connectivity, users may contact PEARL Trading Operations to status or cancel open orders.

For more details on FIX ACOD functionality, please see the PEARL FIX Order Interface Functional Specification on the PEARL website: http://miaxoptions.com/_____.

**MEO Auto Cancel on Disconnect Protection (MEO ACOD)**

The MEO ACOD provides PEARL Members using the MEO Interface to a way limit their exposure during connectivity outages by instructing the PEARL System to automatically cancel all MEO orders upon a loss of connectivity with the PEARL MEO Interface.

- The behavior is always on for all members for all MEO connections.
- The default behavior is that all MEO orders entered by a firm to an engine will be removed upon disconnect of that firm's last MEO connection to that engine.
- All orders received for any MPIDs that send orders on a port group, will be purged when the last port in that port group is disconnected.
- Firms may request custom configurations by delivering MPID and port combinations.

For more details on MEO ACOD functionality, please see the MIAX PEARL MEO Order Interface Functional Specification on the MIAX PEARL website: http://miaxoptions.com/_____.

**Mass Cancellation of Trading Interest**

A Member may cancel all of its quotations and/or all or any subset of its orders in the System by contacting the Pearl Trading Operations Desk. The Pearl Trading Operations Desk will manually execute the Member's request.

**Self-Trading Protection**

The PEARL System contains certain protections to prevent a Market Maker from interacting with their own orders. In the event that a Market Maker sends an order priced at a limit that would allow it to interact with another order from that same Market Maker MPID that is resting on the opposite side of the market, the resting order from that Market Maker MPID will be cancelled by the System and the new order will be accepted by the System.

Self-Trade Protection is available for all Market Maker orders entered via the MEO Interface without regard as to whether the other orders involved were received over the PEARL FOI or MEO Interfaces.

EEMs who use the MEO Interface may request Self-Trade Protection. Orders of the same EEM MPID entered via the MEO Interface will not be executed against orders entered on the opposite side of the market by the same EEM using the same MPID via the MEO Interface. The resting order for the EEM MPID will be cancelled by the System and the new order will be accepted by the System.

**Order Purges**

- Firm Initiated and firm Requested Purges
  - Firms may initiate order purges via MEO with a single request
    - Underlying Security Purges – Purge all orders in a class or classes associated with a specific underlying security for a given MPID.
    - MPID (Wildcard) Purge – Purge every order for all classes on a specified matching engine for a given MPID.
  - PEARL Trading Operations has the ability to quickly cancel all orders by firm request for the following categories
    - Underlying security and MPID.
    - Globally by MPID.
    - Globally by firm.
- PEARL Initiated and Automatic Purges
  - Port Disconnect Purges
    - Default Behavior – If all ports for a given firm on a specific matching engine disconnect, all orders for all of that firm's MPIDs will be purged for that matching engine.

- Port Grouping – Allows firms to specify custom port groupings and regulate automatic purge behavior by group. Contact PEARL Trading Operations for details.
  - o Loss of Heartbeat
    - If all MEO applications on a specific matching engine fail for a given firm, all orders are purged for all of that firm's MPIDs on that matching engine.
      - Port Grouping – Allows firms to specify custom port groupings and regulate automatic purge behavior by group. Contact PEARL Trading Operations for details.
  - o Trading Halt
    - In the case of a trading halt, all orders in all classes associated with the underlying security(ies) that have halted are purged.
  - o Non-tradable Series
    - When a series is made non-tradable, all orders for the series are purged.

**ABBO Crossing Protection** (Management of Non-Routable Liquidity)

The MIAX PEARL Exchange System will not disseminate a locked or crossed market unless such dissemination is done in accordance with Exchange Rules or a National Market System plan (NMS) governing locked and crossed markets. When the System receives a non-routable order that would lock or cross an away market, the System will display the non-routable order at a price that is one MPV away from the current opposite side NBBO and book the order at an undisplayed price that will lock the current opposite side NBBO. Should the NBBO price change to a price that is inferior to the price of the undisplayed booked order, the order's undisplayed price will continuously re-price to lock the new NBBO, and the order's displayed price will continuously re-price one MPV away from the new NBBO until the order reaches its MIAX PEARL Variable Price Protection limit or its original limit price, is fully executed, or is cancelled.

# 8. MIAX PEARL Rules

A copy of the complete MIAX PEARL Rulebook is available in the Regulatory Section of the Exchange's website: http://miaxoptions.com/_____.

Throughout this User's Manual reference is made to MIAX PEARL Rules, in the event of any conflict between a description or discussion of a Rule in this User's Manual and the Rules set forth in the MIAX PEARL Rulebook, the Rulebook shall prevail.

## 9. MIAX PEARL Fees

**MIAX PEARL Fee Schedule**

PEARL operates under a maker-taker fee structure in which the Exchange generally pays its Members a rebate to provide liquidity and generally charges Members a fee to remove liquidity. PEARL may choose apply volume discounts or other incentives to some of its transaction fees.

PEARL also charges membership fees, application fees, market data fees, connectivity fees, bandwidth fees and testing fees.  A link to a copy of the complete PEARL Fee Schedule is available on the Exchange's website under the Fee Summary tab:  http://miaxoptions.com/_____.

## 10. Clearly Erroneous Executions Policy

The Exchange's Erroneous Execution Policy is set forth in Exchange Rule 521 and 522. Participants who believe they may have been a party to an erroneous transaction are encouraged to contact MIAX PEARL Regulation immediately at http://miaxoptions.com/_____. MIAX PEARL Regulatory Control (MRC) will review the transaction to determine whether, in fact, the transaction was the result of an obvious or catastrophic error. Upon final Exchange official action, the MRC, in conjunction with the MIAX PEARL Operations Center (MOC), where appropriate, will promptly notify both parties to the trade and will either nullify or adjust the execution price of the transaction if it qualifies as an obvious or catastrophic error.  A Member may appeal the decision by Exchange officials to the Chief Regulatory Officer (CRO).

## 11. Hours of Operation

**Normal Trading Hours**

Pre-Opening System Availability                            7:30 am to 9:30 am Eastern Time
Regular Trading Session (Equity options)              9:30 am to 4:00 pm Eastern Time
Regular Trading Session (Defined list of ETF options)  9:30 am to 4:15 pm Eastern Time

**Holiday Schedule and Altered Trading Hours**

The Holiday Schedule and any deviations from the Normal Trading Hours listed above can be found on the Exchange's website:  http://miaxoptions.com/_____.

## 12. Contact MIAX PEARL

**Miami International Holdings, Inc.**

Address:             7 Roszel Road, Suite 5-A
                     Princeton, NJ 08540
Phone:               609-897-7300

| Area of Interest | Department | Email |
|---|---|---|
| Investor Inquiries | Investor Relations | Investor.Relations@Miami-Holdings.com |
| Business Development | Business Development | info@MIAXOptions.com |
| Regulatory | Regulatory | Regulatory@MIAXOptions.com<br>Primary: 609-897-7309 |
| Membership | Membership | Membership@MIAXOptions.com |
| Market Operations | Trading Operations | TradingOperations@MIAXOptions.com<br>Primary: 609-897-7302 |
| Connectivity | Trading Operations | TradingOperations@MIAXOptions.com<br>Primary: 609-897-7302 |
| Certification Testing | Trading Operations | TradingOperations@MIAXOptions.com<br>Primary: 609-897-7302 |
| Interface Development | Trading Operations | TradingOperations@MIAXOptions.com<br>Primary: 609-897-7302 |
| Market Data Requests | Market Data | MarketData@MIAXOptions.com |
| Market Data Usage Reporting | Market Data | MarketDataUsage@MIAXOptions.com |
| Listings | Listings | Listings@MIAXOptions.com<br>Primary: 609-897-7308 |
| Sales and Marketing | Business Development | Sales@MIAXOptions.com<br>Primary: 609-897-8177 |
| Billing | Billing | Billing@MIAXOptions.com |