Exhibit 3

Part III: Manner of Operations

Item 3: Exclusion from ATS Services

a. Can the NMS Stock ATS exclude, in whole or in part, any Subscriber from the ATS services?

☒ *Yes* ☐ *No*

If yes, list and provide a summary of the conditions for excluding, in whole or in part, a Subscriber from the ATS services.

The Operator approves and denies Applicants to be Subscribers in its sole discretion. The Operator may reject Applicants and terminate Subscriber Agreements, Expressive Bidding Terms of Service, or both if, for example, an Applicant or Subscriber is charged with, or is determined to have committed, material violations of the federal securities laws, FINRA rules, or other relevant rules or regulations, or is deemed by Operator to have engaged in conduct or activities that may be materially detrimental to the operation of the ATS, the reputation of the Operator or the ATS, or the interests or well-being of other Subscribers or External Users of the ATS.

If Operator personnel become aware of issues related to a Subscriber's participation in the ATS regarding any of the criteria set forth above in Part III Item 2(b) they may bring those issues to the attention of the team responsible for review of new and ongoing Subscribers ("Application Review Team"; which consists of a Registered Principal of the Operator, a Business Development person, and such other personnel as the Operator may designate). If deemed necessary the Application Review Team may convene and determine whether a Subscriber is still eligible for access in light of new information, and if their continued access jeopardizes the well-being of the ATS or other Subscribers. The Application Review Team may take actions including the termination of a Subscriber Agreement or the imposition of restrictions on a Subscriber's activities. If the Application Review Team concludes that action is necessary, they will document the material facts and actions taken before communicating them to the Subscriber via a Registered Principal of the Operator.

If an application is denied, approved subject to terms and conditions, a Subscriber Agreement is terminated, or a Subscriber's activities are restricted, the applicant or Subscriber may request a written explanation of the determination made by the Operator. Upon receiving the Operator's written explanation, the Applicant/Subscriber will have 30 calendar days to respond or otherwise cure that which is the cause of the denial, termination, limitation or restriction of services.

The Operator may disable a Subscriber from interacting with or generating Conditional Invitations if the Operator determines the Subscriber's firm-up rate is too low or if the Subscriber submits firm orders that generate Conditional Invitations and repeatedly cancels those orders within a time period that does not provide a contra Subscriber a reasonable opportunity to execute against the applicable orders. Performance standards may be adjusted by Operator from time to time and will apply uniformly to all similarly situated Subscribers.

b. If yes to Item 3(a), are the conditions required to be identified in Item 3(a) the same for all

Subscribers?

☒ *Yes* ☐ *No*

If no, identify and explain any differences.

Item 9: Conditional Orders and Indications of Interest

a. *Does the NMS Stock ATS send or receive any messages indicating trading interest (e.g., IOIs, actionable IOIs, or conditional orders)?*

☒ *Yes* ☐ *No*

If yes, identify and explain the use of the messages, including information contained in messages (e.g., price or size minimums), how the message is transmitted (e.g., order management system, smart order router, FIX), when the message is transmitted (e.g., automatically by the ATS, or upon the sender's request), the type of Persons that receive the message (e.g., Subscribers, Trading Centers), responses to conditional orders or IOIs (e.g., submission to firm-up conditional orders), and the conditions under which the message might result in an execution in the ATS (e.g., response time parameters, interaction, and matching).

The OneChronos ATS accepts "Conditional Indications." A Conditional Indication is an instruction to the OneChronos ATS expressing potential interest to trade subject to counterparty liquidity availability. A Conditional Indication is not in itself an order. If the OneChronos ATS determines that there may be counterparty liquidity to interact with, via a process described below, the ATS cancels the Conditional Indication and sends a Conditional Invitation to the Subscriber, inviting the Subscriber to send a firm order in response ("Firm Up Order"), and providing the Subscriber with a specific Invitation ID (see next paragraph). Firm Up Orders sent in response to a Conditional Invitation are treated identically to firm orders that have equivalent order instructions, as described in Part III Item 7, with the following exceptions: 1) Firm Up Orders may be canceled, but may not be canceled and replaced, 2) Firm Up Orders must be received by the ATS within 1 second of the timestamp on the associated Conditional Invitation, 3) Firm Up Orders are always eligible as contra-side interest to Conditional Indications whereas regular firm orders must opt-in on an order-by order basis or at the session level to generate Conditional Invitations and thereby be available as contra-side interest to Conditional Indications, with the eligibility for opted-in firm orders ~~as follows (i) within a Custom Counterparty Group firm orders are available as contra-side interest to Conditional Indications for an applicable firm order~~ with any time-in-force~~, and (ii) outside of a Custom Counterparty Group firm orders are available as contra-side interest to Conditional Indications if the applicable firm order has a time-in-force of GTD, FOK, or IOC~~, and 4) Firm Up Orders must have the same symbol, side (with Sell, Sell Short, and Sell Short Exempt considered equivalent between the Conditional Indication and Firm Up Order), Custom Counterparty Group (if relevant), and Subscriber identifier as the original Conditional Indication, and if the Conditional Indication allowed for interaction outside the Custom Group, the associated Firm Up Order must also allow for interaction outside the Custom Group, otherwise the order is rejected. Conditional Indications have the same order instruction flexibility and requirements as firm orders at OneChronos (for example, peg instructions and

minimum quantity).

In addition, Subscribers must send the Firm Up Order on the same (FIX) order entry session that they sent the Conditional Indication on. Subscribers identify which Conditional Indication is associated with their Firm Up Order via the Invitation ID that was sent to them on the Conditional Invitation that the Subscriber is responding to; specifically, they include the Invitation ID with their Firm Up Order instruction.

With the exceptions noted above, Firm Up Orders behave and participate in the same manner as all other firm orders with equivalent order instructions. They are able to trade amongst other Firm Up orders as well as standard (firm) orders in OneChronos ATS auctions. Firm orders have the option to opt-out of interacting with Firm Up orders, by including a specific instruction on an order-by-order basis or at the session level. The timestamp on the Firm Up Order, not the Conditional Indication, is used to determine eligibility for an auction.

During the "Auction Preprocessing" step of the OneChronos Auction Procedure (described in Part III Item 11b), the OneChronos ATS: 1) looks for counterparty liquidity for Conditional Indications that it has received, and 2) sends Conditional Invitations out where applicable. This process is performed continuously in advance of the Initialization Time (described in Part III Item 11b). Cancellations for orders and Conditional Indications received during the Auction Preprocessing step are processed immediately. For a given Conditional Indication to receive an Invitation ID, there must be one or more contra-side orders or Conditional Indications in the symbol ("conditional contras") such that the following five constraints are satisfied:

INVITE ELIGIBILITY CONSTRAINT: All Firm Up Orders and Conditional Indications are eligible as conditional contras. A Subscriber may opt-in to generate Conditional Invitations on firm orders ~~and will apply to firm orders within Custom Counterparty Groups~~ for any time-in-force~~. Opt-in eligibility for firm orders outside of a Custom Counterparty Group is limited to firm orders with a time-in-force of GTD, FOK, or IOC~~. If a Subscriber sends a firm order and does not specify a Custom Group, that order is not eligible as a conditional contra unless the firm order has opted in to generate Conditional Invitations outside of a Custom Counterparty Group ~~and satisfies the applicable time-in-force requirements~~.

PRICE CONSTRAINT: The conditional contras must have marketable prices that can match with the given Conditional Indication.

QUANTITY CONSTRAINT: The conditional contras must provide sufficient quantity to satisfy a minimum quantity constraint on the given Conditional Indication, where present.

SELF-TRADE PREVENTION CONSTRAINT: The ATS will not send conditional invites to a Subscriber with self-trade prevention enabled that has otherwise-eligible conditional contras (e.g. Firm Up orders or Conditional Indications) on both sides of a symbol unless the other four constraints hold independently of that Subscriber's conditional contras (i.e., if there are orders or Conditional Indications from other Subscribers that are eligible to match with the given Conditional Indication).

CUSTOM COUNTERPARTY GROUP CONSTRAINT: Custom Counterparty Group logic

for orders and Conditional Indications (described in Part III Items 11 and 14) is respected. For example, if the given Conditional Indication has a constraint to only execute with a Custom Counterparty Group, then the set of conditional contras considered for inviting the given Conditional Indication is restricted to orders or Conditional Indications from that specific Custom Counterparty Group that the Firm Up order would be eligible to interact with. However, if a given Conditional Indication does not restrict interacting with orders or Conditional Indications outside the Custom Counterparty Group, the conditional contras will include all orders and Conditional Indications that satisfy the constraints set forth in the INVITE ELIGIBILITY CONSTRAINT section above.

b. *If yes to Item 9(a), are the terms and conditions governing conditional orders and indications of interest the same for all Subscribers and the Broker-Dealer Operator?*

☒ *Yes* ☐ *No*

If no, identify and explain any differences.

Item 11: Trading Services, Facilities and Rules

a. *Provide a summary of the structure of the NMS Stock ATS marketplace (e.g., crossing system, auction market, limit order matching book) and explain the means and facilities for bringing together the orders of multiple buyers and sellers on the NMS Stock ATS.*

MATCHING SYSTEM: Rather than matching orders continuously as they arrive at the matching engine (as in a continuous limit order book) the ATS periodically holds auctions designed to seek an optimal matching between buyers and sellers across all eligible orders. As part of this mechanism, Subscribers can enter Limit Orders or Peg Orders in single securities or, by the use of Expressive Bidding, specify execution instructions that span one or more Target Orders (note, the ATS supports up to two Target Orders in a given Expressive Order). Expressive Bidding allows External Users to express constraints on orders to fit their business specific execution and or risk management objectives. As explained in Part III Item 7, Expressive Orders are comprised of Target Orders sent via FIX by Subscribers; Bidder Logic (computer code specifying constraints); and Bidder Inputs or Market Inputs, if any, to complement the Bidder Logic as it may apply to a given Target Order. Auctions are multilateral: one or more buyers can match against one or more sellers. Within a given auction the mechanism computes per-security uniform transaction prices that apply to all buyers and sellers of that security. The ATS matching mechanism is a call auction in that order matching happens at a specific point in time. All NMS stocks are eligible to trade in the ATS, with the exception of any NMS stocks that cannot be processed by the ATS's clearing or trade reporting partners. Eligibility is subject to procedures described in Part III Item 10 (Opening Procedure).

DISTRIBUTED POINT OF PRESENCE SYSTEM: The Operator maintains a distributed and time-synchronized PoP system at multiple data centers for order entry and market data intake (see also Item III, Part 5 above for further information on the PoP system). Although matching happens at a centralized location, Subscribers can enter orders at any PoP. PoP arrival timestamps dictate order eligibility. Orders received at a PoP by a Cutoff Timestamp (the "Cutoff" or "Cutoff Time") selected by the ATS for a given auction are eligible for matching

in that auction; orders received after the Cutoff are not eligible until the next auction. By using PoP arrival timestamps (rather than matching engine arrival timestamp) as described below, the distributed PoP system endeavors to promote equality of access to Subscribers with systems located in different geographies. The Operator operates the ATS with a PoP in Equinix NY5 at 800 Secaucus Road, Secaucus, New Jersey 07094 and an additional PoP at Equinix NY3 at 600 Jefferson Avenue, Secaucus, NJ 07094.

ORDER ENTRY AND EXECUTION PROCESS: PoPs apply high precision (recorded in nanoseconds) timestamps to orders as they arrive. After receiving a timestamp, orders proceed to the matching engine located at Equinix NY5 in Secaucus, NJ. Orders are eligible for all auctions with a Cutoff Time greater than or equal to their PoP timestamp. The Cutoff Time is also used as a basis for computing NBBO (see Part III Item 23). Aside from the determination of orders' eligibility, the auctions have no notion of time priority (i.e. all orders participating in the same auction are on parity from a time perspective). Price priority and share allocation proceeds per the mechanism described in Part III Item 11(c).

Because orders require time to propagate from their entry PoP to the matching engine, the matching engine pauses for a duration (the "**Buffer Window**" or "**Buffer**") long enough to allow the arrival of market data from the SIP as well as orders from all PoPs before commencing an auction. The duration of the Buffer Window is calibrated based on measured historical and real-time network latencies and may change over time but will remain on the order of milliseconds or tens of milliseconds. This Buffer seeks to prevent orders entered at PoPs further (in the sense of network transmission time) from the matching engine from experiencing a time disadvantage relative to PoPs closer to the matching engine. Execution report dissemination uses a similar system as described in Part III Item 21.

REGULAR TRADING SESSION AND EARLY TRADING SESSION: The ATS operates a Regular Trading Session and, starting on June 17, 2026, an Early Trading Session. Subscribers may designate orders submitted to the ATS on an order-by-order basis or at the session level as (i) only eligible for the Regular Trading Session or (ii) eligible for both the Early Trading Session and Regular Trading Session. Orders received without a specific instruction as to session eligibility will by default only be eligible for the Regular Trading Session. All order instructions are available in both the Early Trading and Regular Trading Sessions; however, while the Early Trading Session immediately commences trading at opening in accordance with the ATS' standard matching and execution logic, the Regular Trading Session commences trading, on a security-by-security basis, only once there has been an opening or a re-opening print from the primary listing exchange for that security.

b. *Are the means and facilities required to be identified in Item 11(a) the same for all Subscribers and the Broker-Dealer Operator?*

☒ *Yes* ☐ *No*

If no, identify and explain any differences.

c. *Explain the established, non-discretionary rules and procedures of the NMS Stock ATS, including order interaction rules for the priority, pricing methodologies, allocation, matching,*

and execution of orders and trading interest, and other procedures governing trading, such as price improvement functionality, price protection mechanisms, short sales, locked-crossed markets, the handling of execution errors, and the time-stamping of orders and executions.

The core mechanism underlying execution on the ATS is the combinatorial call auction process. This auction process uses a matching optimization formula that considers orders in all securities in a given auction simultaneously in an effort to identify mutually beneficial matches between buyers and sellers across the ATS's entire market.

AUCTION PROCEDURE: In summary, auctions consist of the following steps:

0) "Auction Preprocessing": the OneChronos ATS analyzes orders, Conditional Indications, and market data (all received prior to the start of this step) for conditional counterparty liquidity and sends Conditional Invitations, as described in Part III Item 14. Conditional Indications and orders received after the start of this step will not be processed until Auction Preprocessing for the subsequent auction.

1) "Initialization Time": an auction Cutoff Time (as defined in the following paragraph) which is randomly chosen per the procedure described below as the start of an auction;

2) "Auction Network Buffer" (or "Buffer"): this Buffer is intended to allow orders and market data enough time to arrive from distant PoPs as described in Part III Item 11(a). More specifically, the Buffer allows sufficient time for orders and market data to arrive from the furthest (measured in network transmission time) PoP from the matching engine. The length of the Buffer can vary based on expected transmission times, but would typically be on the order of milliseconds or tens of milliseconds;

3) "Match Optimization": ATS systems evaluate Expressive Orders and run the combinatorial matching process, which determines prices and share allocations across all symbols;

4) "Post Auction Network Buffer": upon completion of the Match Optimization process, the matching engine broadcasts auction results to all PoPs. Each PoP waits until a pre-determined time (which always precedes the following auction's Cutoff), to distribute execution reports, thereby providing a synchronized dissemination of such data externally. As with the Auction Network Buffer, the length of the Post Auction Network Buffer can vary based on expected transmission times, but would typically be on the order of milliseconds or tens of milliseconds;

5) "Data Dissemination": at the conclusion of the Post Auction Network Buffer period, PoPs communicate auction results in the form of execution reports to external parties, including Subscribers, the ATS's direct clearing provider, and the Trade Reporting Facility.

The complete lifecycle of these steps spans a timescale of less than 100 milliseconds. Auctions occur at discrete "Cutoff Times", following the completion of the prior auction lifecycle, drawn at random within a range of 20 milliseconds to 200 milliseconds from the previous auction. When the Auction Network Buffer has elapsed, the matching engine establishes auction eligibility per the PoP arrival timestamps as described in Part III Item 11(a). At this point, Market Inputs used by Expressive Orders and the data used for constructing NBBO is final. See Part III Item 23 under MEASUREMENT OF MARKET DATA AND NBBO for a detailed

explanation of NBBO construction. All ATS timestamps, including those that appear on execution/trade reports, are recorded in nanoseconds.

AUCTION ELIGIBILITY: the ATS accepts orders and Conditional Indications (Conditional Indications are described in Part III Item 9). Subscribers can send cancellation requests for resting orders and Conditional Indications. Cancellation requests received and timestamped before the Cutoff Time have immediate effect. Cancellation requests received after the Cutoff Time but before the completion of the auction cycle do not have effect until the following cycle (and therefore the order may still participate in the auction notwithstanding the cancellation request). The order entry system removes the referenced order from the matching engine as soon as the next auction window opens if the order is still present (not filled) and rejects it otherwise. With regards to a partial fill, the residual quantity is treated as the maximum fill quantity for the order in subsequent auctions, unless its time-in-force instructions dictate that it be cancelled.

RISK CONTROLS: After determining auction eligibility (per Part 3 Item 11(a)) and selecting market data (per Part 3 Item 23) upon the completion of the Auction Network Buffer, the ATS carries out a series of pre-match market quality and risk checks. These consist of testing for locked and crossed markets (rules for trading during locked and crossed markets follow later in this section), verifying that user configured risk checks pass, and flagging "clearly erroneous orders" as ineligible. For Subscriber controlled risk checks, the following parameters are configurable within the bounds established by the ATS (see Part III Items 7 and 8 for minimum and maximum values):

1) Total notional value maximums per order;

2) Total quantity maximums per order;

3) Symbol restrictions;

4) Short sale restrictions;

5) Self-Trade prevention by MPID and/or FIX session;

As an additional risk control, orders with External User-supplied prices 10% or more aggressive than the NBBO are not eligible for participation~~. The~~, and the ATS ~~rejects~~marks orders for which this is true ~~at the time of submission~~as ineligible. Subscribers can configure this behavior to be more restrictive (i.e. less than 10%) but not less restrictive (i.e. greater than 10%). The ATS may also enforce share quantity and notional value constraints according to maximums put in place by the ATS's clearing provider.

MATCH OPTIMIZATION: After identifying a set of eligible, risk checked orders, matching of firm orders can proceed (Conditional Indications are not evaluated during this phase). Matching is conducted via a uniform clearing price combinatorial auction - a form of mathematical optimization that attempts to match one or more buyers with one or more sellers in a fashion that maximizes the chosen objective(s) while enforcing constraints. Because orders can include constraints that span securities (e.g., buy A if and only if an accompanying order for B gets filled) the optimization process must run over all securities simultaneously. The

optimization procedure includes a rule that the solution found must respect the constraints placed on orders by participants (e.g. price limits, volume ratios) as well as the market wide constraints placed by the ATS (e.g., ensuring that aggregate buy fill volume equals aggregate sell fill volume on a security-by-security basis).

The ATS optimization process consists of multiple optimization techniques (see "Additional Details on Optimization" below) that attempt to maximize the following two objectives:

1) Aggregate Price Improvement: the optimization attempts to maximize the total price improvement realized across all orders eligible to participate in the auction, incorporating both price per share and number of shares filled. For an individual order to buy or sell a single security, "Price Improvement Dollars" refers to the difference between the limit price on the order and the auction clearing price (i.e. the price at which the order is filled) for the given security, times the quantity filled. For an Expressive Order to buy and/or sell multiple securities simultaneously, price improvement refers to differences in limit prices and clearing prices for each respective security, summed across all securities times the quantities filled. See below under "Priority and Price Formation Example" for information on treatment of NBBO. When considering a crossed buy and sell order for a security, Price Improvement Dollars can be calculated as the difference between limit prices for the two orders. Aggregate Price Improvement represents the sum of Price Improvement Dollars across all eligible orders under consideration for a given optimization solution, and across all securities. As a result, it is possible that an order (i.e. Standard Order or Expressive Order) may receive lower match priority in favor of an Expressive Order containing a less aggressively priced Target Order in the same security. This can occur if and only if prioritizing the less aggressive order results in a solution that is at least as optimal as other feasible solutions that include the more aggressive order (see a specific example lower in this section under heading: Priority And Price Formation Example). In other words, maximizing Aggregate Price Improvement is the dominant and first objective of the optimization.

2) Volume: as a secondary objective, the optimization attempts to maximize the total share volume cleared in aggregate across all securities.

Each optimization technique evaluates these two objectives using a mathematical formula known as an objective function to implement the priority outlined above, producing one or more sets of potential executions ("solutions"). The solution with the highest value (i.e. score) of the objective function is selected. A solution that represents the largest value of the objective function possible is known as globally optimal. Given finite computing resources obtaining globally optimal solutions is not always possible. Furthermore, globally optimal solutions are not always unique in that multiple solutions might yield identical values for the optimization objective. The ATS is designed such that solutions: a) do not violate constraints placed on orders by users or the global constraints placed by the ATS, such as those described below under "LOCKED AND CROSSED MARKETS" and those in Part III Item 20; and b) are optimal amongst the solutions explored during the optimization process. In the event that multiple solutions are equally optimal (i.e., have equal values of the objective function), any candidate in the set of equally optimal solutions may be selected based on which solution maximizes filled shares in Custom Counterparty Groups, which solution maximizes the average fill size of each execution, or a solution may be chosen randomly. The tie-breaking

logic is the same for all Subscribers and in all cases does not consider the identity of Subscribers or the identities of their respective clients.

Once a solution to the optimization is identified, clearing prices are determined for each symbol. A solution to the optimization represents a matching of buyers to sellers for which it is possible to find a list of per-security auction clearing prices (the "price vector"). For a given auction, all orders selected for participation via the solution to the optimization receive fills at the same clearing price on a per-security and, where applicable, a per-Custom Group (see below) basis. A given output to the optimization might yield more than one possible set of clearing prices (solution). When more than one possible set of clearing prices is identified, the ATS then uses a secondary procedure that seeks to identify distinct per-security clearing prices at the middle of the feasible range of clearing prices. In the absence of a two-sided quote (measured as described in Part III Item 23) the optimizer uses the last trade price (also measured as described in Part III Item 23) instead of the midpoint. The optimization solution represents a matching of buyers and sellers and is the mechanism for establishing order priority and share allocation.

When orders with identical sets of constraints enter the auction (e.g. Limit Orders for the same security at the same limit price with no further constraints) an individual optimization technique may treat them as components of a single, larger "synthetic" order. When this approach results in a partially filled synthetic order (i.e. when there is insufficient volume on the contra side to fill the entire synthetic order), allocation to constituent orders happens via a randomized round-robin mechanism. Round-robin allocation is equivalent to:

1) Assigning a random sequencing to all constituent orders;

2) Allocating a random number of shares (up to 100 shares at a time) to constituent orders according to the random sequence, honoring all constraints (e.g. maximum quantity);

3) Repeating step 2 above until the supply of available contra shares runs out.

In the case where only Limit Orders and Peg Orders with no further constraints (i.e. beyond price / quantity constraints) are eligible to participate for a given security (in a given auction), the ATS match process behaves the same as described above.

CUSTOM COUNTERPARTY GROUPS: As described in Part III Item 14, the ATS offers functionality for Subscribers to specify Custom Groups of counterparties against which to execute on an order-by-order basis or at the session level. The optimization logic for determining which orders execute, and at what price, is the same for orders within a Custom Group as for orders outside the Custom Group. Subscribers may provide an execution instruction on their Custom Group order to specify whether they would like their order to only execute against other orders in the Custom Group (which is also the default behavior if no instruction is provided), or to allow some or all of their order's fillable quantity to be executed outside of the Custom Group (i.e. in cases where not all of the order's fillable quantity can be executed within the Custom Group). The number of shares executed within Custom Groups is used as a tie-breaker in the optimization process described in Part 3 Item 11 under the MATCH OPTIMIZATION heading.

All orders in a given security that do not execute as part of a Custom Group will execute at the same price in a given auction. Given the different set of counterparty liquidity within Custom Groups, Custom Group orders may receive executions at different (i.e. potentially better or worse) prices than orders not in that particular Custom Group. As also discussed in Part III Item 14, orders may participate in multiple Custom Groups simultaneously. In this scenario, an order may be executed at unique prices per Custom Group in which it executes. As discussed in Part III Item 21, the OneChronos ATS submits one trade report per price per symbol per auction.

ADDITIONAL DETAILS ON OPTIMIZATION: Combinatorial auctions belong to a class of computationally intensive search and optimization tasks known as non-deterministic polynomial-time (NP) hard problems. Given that problem instances (auctions) could allow for varying degrees of complexity and therefore computational requirements, they cannot always be exhaustively evaluated. Accordingly, the ATS uses time and resource bounded optimization techniques whereby computational resources are utilized over a period of time lasting on the order of 10s of milliseconds. The amount of resources to be used for a given auction optimization cycle is fixed a priori and arrived at without knowledge of the orders participating in a given auction cycle. Between auctions, the total amount of resources available for optimization may fluctuate as a function of historical and expected future need for computational resources. While these optimization techniques are intended to improve the efficacy of the matching process, they might not identify a globally optimal solution in every scenario. Specifically, the optimizer makes decisions about the allocation of finite computing resources to exploring subsets of the solution space in ways that might leave portions of the search space unexplored.

To ensure that the optimization techniques utilized by the ATS do not result in a "worse" overall outcome for Subscribers than if the ATS utilized individual security-by-security order books for matching securities, every auction includes a "lower bounding" procedure. The lower bounding procedure is deterministic and works by computing the value of the hierarchical objective strictly considering the components of Limit Orders, and Peg Orders. This produces a similar set of outcomes as a traditional per-security call auction would if it were to use a similar matching objective. As such, it places a deterministic lower bound on the performance of the optimization. A solution found through this deterministic search process is selected if it maximizes the objective function more than other solutions found by the optimization process.

PRIORITY AND PRICE FORMATION EXAMPLE: Illustrative examples of the ATS optimization, and price assignment procedure follow.

Example 1: Basic Bilateral Fill

Order 1: Buy 100 @ $10.01

Order 2: Sell 100 @ $10.00

Orders 1 and 2 will fill 100 shares @ 10.005. Any price in the interval [$10.00, $10.01] is a valid clearing price that will maximize price improvement. In the absence of these other

constraints, OneChronos will fill at the midpoint of the clearing price range.

Example 2: Basic Multilateral Fill

Order 1: Buy 100 @ $10.01

Order 2: Buy 100 @ $10.01

Order 3: Sell 200 @ $10.00

Orders 1 and 2 will fill 100 shares at $10.005. Order 3 will fill 200 shares @ 10.005.

Example 3: Expressive Bidding Order 1: Buy 100 ABC @ \$10.01 (Target Order from Subscriber A) Order 2: Sell 100 ABC @ \$10.00 (from Subscriber B)

In this example, Subscriber A has entered a Target Order using the Expressive Bidding functionality, and has specified via Bidder Logic and Market Input that its Target Order should fill only if it is executed at the midpoint of the NBBO. If we assume the midpoint of the NBBO is $10.005, then since the constraint is met, Orders 1 & 2 will match at $10.005 (as in Example #1) and is equivalent in outcome to a midpoint Peg order.

Example 4: Pairs Expressive Bidding

Order 1: Buy 100 ABC @ $10.01 (Order #1 of a Pair Order from Subscriber A)

Order 2: Sell 100 XYZ @ $30.00 (Order #2 of a Pair Order from Subscriber A)

Order 3: Sell 100 ABC @ $10.00 (from Subscriber B)

Order 4: Buy 100 XYZ @ $30.01 (from Subscriber C)

In this example, Subscriber A has entered a pairs order using the Expressive Bidding functionality, and has specified via Bidder Logic that both orders should fill, or neither order should fill. Since there is contra interest on both sides, Orders 1 & 3 will match at $10.005 (as in Example #1), and similarly, Orders 2 and 4 will match at $30.005.

Example 5: Multilateral Limit Order Fill

Order 1: Sell 100 shares, midpeg, @ $20.33

Order 2: Buy 25 shares, limit @ $20.40

Order 3: Buy 25 shares, limit @ $20.36

Order 4: Buy 50 shares, limit @ $20.35

NBBO: $20.32 x $20.35

In this example, all four orders will fully fill at $20.3425. The midpoint of the NBBO is

$20.335, which is more passive than the sell order's limit price of $20.33, therefore the effective limit price of the sell order becomes $20.335. All buy orders' limit prices are at or more aggressive than the NBO of $20.35, so their effective prices are each $20.35. The range of clearing prices is then [$20.335, $20.35]. Any fill price in this interval will result in an aggregate price improvement of $2, so the midpoint of the range is chosen.

The aggregate price improvement is calculated as follows:

(($20.3425 - $20.33) * 100) + (($20.35 - $20.3425) * 25) + (($20.35 - $20.3425) * 25) + (($20.35 - $20.3425) * 50) = $2

LOCKED AND CROSSED MARKETS:

The ATS flags securities as locked or crossed at the start of each auction using the NBBO "snapshot" created using the procedure described in Part III Item 23(a) "MEASUREMENT OF MARKET DATA AND NBBO." Because the time scales on which auctions run (10s of milliseconds) are much longer than the duration of a typical locked market (< 100 microseconds) the ATS allows Subscribers to specify via a port level setting if their orders for locked securities should remain eligible for the auction. Subscribers making this election might receive executions during a locked market. The default setting permits executions during locked markets. The ATS does not execute trades in crossed securities as measured by the process described in Part III Item 23. Securities that were not crossed at the time of measurement (i.e. at the Cutoff Time) but become crossed during the auction may still receive fills.

EXECUTION ERRORS:

The Operator maintains Written Supervisory Procedures that include procedures for handling execution errors. Execution errors may be the result, for example, of an ATS system failure, an error on the part of an ATS Subscriber, or an error in data (e.g. NBBO) provided to the ATS and used in executing a trade. In any of these cases, ATS personnel contact all Subscribers party to the transaction or transactions affected by the error and determine the appropriate course of action. If all Subscribers party to the trade wish to keep the trade in place and applicable FINRA, SEC, and SRO rules allow, no action is taken and the trade is processed. If one or more of the Subscribers wishes to break or correct a trade, the Operator may accordingly cancel or issue corrections for erroneous trades. If the Operator determines a transaction to be a bona fide error, the Operator may in its sole discretion accept erroneous legs of a transaction into an error account maintained with the Operator's clearing provider. The Operator promptly trades out of any positions it takes into the error account via execution services offered by its clearing provider. The CCO reviews all activity in the Operator's error account on a monthly basis to ensure that the account maintains a zero balance and that the account is only used for bona fide errors.

d. *Are the established, non-discretionary rules and procedures required to be identified in Item 11(c) the same for all Subscribers and the Broker-Dealer Operator?*

☒ *Yes* ☐ *No*

If no, identify and explain any differences.