

Virtu Americas LLC

Order Handling and Execution Protocols for Broker-Dealer Clients

Virtu Americas LLC (“VAL” or “Firm”) makes a market in or trades nearly every U.S. equity security except securities that may from time to time be subject to restrictions. VAL does not make a market in the common stock of its parent Virtu Financial, Inc. (NYSE: VIRT).

This document is intended to provide a summary description of how VAL, as a wholesale market maker, handles orders that broker-dealer clients route to the Firm in NMS and non-NMS OTC equity securities (“OTC Securities”). However, the handling of individual orders may at times deviate from the descriptions contained herein.

If you have any questions regarding these execution protocols, contact Robert Verderese at 646.682.6309 or rverderese@virtu.com

General Information

When clients route orders to VAL, they are routing orders to a market maker who executes those orders as principal.¹ As such, VAL is the market center for all such orders. VAL’s wholesale market making offering is structured into Trading Units. These Trading Units are generally separated according to the characteristics of the order routed to the Firm as well as the underlying technology utilized to handle the order.

When VAL internalizes a client order, the Firm provides an execution that is at, or within, the National Best or Offer (“NBBO”) disseminated to the system responsible for executing the client order at that time. To the extent that orders are not internalized, VAL may route principal orders to other market centers, including its own alternative trading systems (MatchIt and POSIT), other market makers, other alternative trading systems (“ATs”) and National Securities Exchanges (“Exchanges”), to fill all or part of an order. Executions that are received as a result of these routed orders are applied to client orders at the same price in a riskless principal capacity or at an improved price. When the client order is filled at the same price the Firm reports its capacity as riskless principal and when the client order is filled at an improved price the Firm reports its capacity as principal.

The Firm’s internalization models utilize Exchange book feeds to access data regarding depth of book, changes to that depth and the current spread as compared with historical spreads, among other things. The Firm’s order routers utilize a combination of Exchange book feeds and SIP data to make routing decisions.

Clients often provide VAL with Effective/Quoted (‘E/Q’) targets in connection with handling their orders. VAL will handle client orders in a manner which seeks to meet those client targets on an aggregate basis over time. However, all orders are subject to market conditions and, accordingly, VAL does not guarantee that it will meet E/Q targets, that any particular order will be filled, or in the case of a market order that is filled, that it will be filled at any particular price.

¹ In limited instances, where the Firm may be restricted from transacting in a particular security, orders may be routed on an agency basis.



There are several factors that can affect how VAL handles a particular order including but not limited to:

- Whether market conditions in the security are normal (please see following section for a description of non-normal market conditions)
- The stock's liquidity/volume and volatility (overall and/or momentary)
- The size of the order
- The Firm's and/or trading desk's current position and risk tolerance in the stock
- Any client-provided preferences or instructions (for example, size parameters for automated vs. manual handling)
- Certain market center/Exchange(s) rules
- The order type (e.g., market, limit, All-or-None, fractional, notional, etc.)

The above factors can affect whether any execution occurs, the speed of order handling and/or the availability of price improvement as compared to the NBBO.

Non-Normal Market Conditions

VAL's Execution Protocols assume normal market conditions. VAL reserves the right, at its sole discretion, with or without notice, to determine if, and when, market conditions are non-normal. Non-normal market conditions include, but are not limited to:

- Locked or crossed markets
- Limit Up/Limit Down Trading Halts
- Markets, market data and/or market participants that are unusually volatile, unreliable and/or unresponsive for any one or more symbols or sectors
- Periods of significant order imbalances either at the Firm or at the stock's primary listing exchange ("Primary Exchange")
- Non-regulatory trading halts (beginning from the time of the last print on the stock's Primary Exchange before the Exchange's declaration of the halt and ending when the stock's Primary Exchange ends the halt by resuming its normal quoting and printing operations)
- Periods of time when an Exchange places a stock in "non-Firm quote" mode or similar quoting mode
- Periods of unusually wide spreads (in the inside market or by the stock's Primary Exchange) or aberrational market movements
- Periods of time surrounding significant news events (whether, or not, those news stories result in a regulatory halt of the stock)
- Secondary trading of IPOs
- Communications or systems outages
- Reg NMS Self Help Declarations
- Reg SHO restrictions



Cancellation of Orders

A client may request that any unfilled order (or unfilled portion of an order) be canceled. The Firm retains discretion to grant or deny cancellation requests. Circumstances under which the Firm may deny a cancellation request include when the Firm has executed all or part of the order, has routed a principal order to another market center to fill the order or is otherwise in the process of executing the order.

Clearly Erroneous Executions

Bona fide errors can result from human error or system issues that affect the execution of an order. Such errors can occur at VAL or can occur outside of VAL at an Exchange, an ATS or at other market centers utilized by VAL in connection with the execution of the order. Such errors can also result from general market volatility, communications or system breakdowns or other conditions over which VAL has no control. VAL reserves the right at its sole discretion to cancel or price-adjust any trade that is deemed by VAL to have been the result of an error, including the result of any of the above or an incorrect security symbol or name, size and/or prices that are unrelated to the market. In the event that VAL exercises this right, the Firm will use reasonable efforts to inform its clients in a timely manner.

Corporate Actions

When a stock is subject to a corporate action, (e.g., distributions, dividends, splits, etc.), VAL will adjust or cancel open orders that reside on its open order book as required pursuant to applicable regulations.

When dividends are payable in cash or securities, VAL will adjust the price of an open order, where the terms of the order allow for modification, by the greater of the value of the cash dividend or stock dividend. An order that is subject to a dividend will not be adjusted by VAL if the value of the dividend is less than \$.01 per share.

You may choose to enter orders with a "do-not-reduce" (DNR) instruction if you do not want the price of an order reduced for cash dividends; or with "do-not-increase" (DNI) instructions if you do not want the size of an order increased for stock dividends or stock distributions. A "do not reduce" order applies only to ordinary cash dividends; the order should be reduced or increased for other distributions such as when a stock goes "ex" a stock dividend, special cash or ex rights.

It is VAL's policy to cancel all open orders in stocks subject to reverse stock splits, forward stock splits, or stock splits that involve a symbol/CUSIP change and other applicable circumstances on the effective date of the corporate action. Additionally, all orders with distributions that have indeterminable values are deemed cancelled. VAL typically will cancel orders back to clients on an automated basis, however clients should be aware that the orders are deemed cancelled in these circumstances whether or not the cancellation notice is received electronically. Where there are conflicting or unclear Corporate Action notices, the Firm may pause orders in those securities until such time that there is confirmation or clarity around the Corporate Action or cancel those orders back to the client.

VAL transmits a daily "Corporate Action" e-mail that identifies stock splits, dividends, symbol/CUSIP changes and symbol additions and deletions. VAL's transmission of this information is purely for informational purposes. VAL does not guarantee the accuracy of the information or that it will make such information available on any particular day. Clients remain responsible for adjusting orders sent



to VAL after the effectiveness of a corporate action. You may request to be added to the distribution by contacting us via e-mail to Help@virtu.com.

Order Types, Instructions, and General Handling Information

Duration

Unless otherwise specified, VAL considers client orders to be Day Orders. Day Orders will not be eligible for execution until the beginning of the regular trading session and unfilled portions of partially executed Day Orders will expire at the end of the regular trading day on the day that the order was received (generally, 4:00 p.m. Eastern Time).

Order Conditions for Extended Trading Hours

VAL offers order types that are eligible for execution only in the pre-market, orders that are only eligible for execution in the after-hours and orders that are eligible for execution all day. Access to pre-market, after-hours, and all day sessions is subject to VAL's approval, the successful completion of testing and the client's assumption of the risks, including those set forth below. For additional information please contact a VAL representative. Clients are responsible for ensuring that they and their clients understand and are able to bear the risks associated with trading outside of regular market hours and that these order types are suitable for the end client.

Generally, for clients that participate in VAL trading sessions outside of the normal market hours (from 9:30 am – 4:00 pm) ET they may elect to participate in the following sessions:

Pre-Market – allows orders to be facilitated only during the VAL pre-market session, currently from 7:00:00 am through 9:28:00 am ET. The time-in-forces (“TIFs”) of Immediate-or-Cancel and Fill-or-Kill are available in the pre-market session as well.

All Day Trading – allows orders to be facilitated during all available VAL trading sessions, currently from 4:00:00 am through 8:00:00 pm ET. for the TIFs of Immediate-or-Cancel and Fill-or-Kill are available in all sessions. All Day Trading Orders will be represented on an Exchange in the pre-market session and will not be routed to the Primary Exchange for participation in the open.

After Hours Trading – allows orders to be facilitated only during the VAL post market session, currently from 4:00:01 pm through 8:00:00 pm ET. The TIFs of Immediate-or-Cancel and Fill-or-Kill are available in the post-market session.

Overnight - allows orders to be facilitated only during the overnight session of trading, currently from 8:00:00 pm through 4:00:00 am ET. At this time, all orders routed for handling in the overnight session will be handled with a TIF of DAY.

The actual start and the end time of trading session, outside of the normal market hours, may vary based on client request.



Market Orders: VAL will accept market orders and attempt to execute at prices that are available in the market following receipt of the order until the order is completed or canceled. Although the Firm endeavors to execute market orders that it receives fully and promptly, certain market orders (for example, quantity in excess of share size parameters, illiquid securities, certain triggered stops, etc.) may be sent to a trader for manual handling. In these scenarios, VAL interprets the term promptly to mean in a fashion that considers the shares ordered against the available liquidity and VAL may execute the order over longer periods of time consistent with the liquidity reasonably available and the depth of the market.

Limit Orders: VAL will accept limit orders and hold them for the applicable duration or time in force until the order is executed at its limit price or better or canceled. Although the Firm endeavors to execute marketable limit orders that it receives fully and promptly, certain marketable limit orders (for example, quantity in excess of share size parameters, illiquid securities, triggered stops, etc.) may be sent to a trader for manual handling.

Good-Til-Cancelled (GTC) and Good-Til-Date (GTD) Orders: A GTC/GTD order will remain open on VAL's books until executed, cancelled by the client that placed the order or cancelled by VAL, or in case of GTD until the order expires at its designated time-in-force date but no later than one calendar year, whichever comes first. Please note, however, that GTC/GTD orders are only eligible during regular market hours - not during after-hours trading, overnight, or pre-market trading sessions. GTC/GTD orders are eligible for execution and for market / limit order protection during regular market hours. VAL maintains GTC/GTD orders on file for one calendar year. If a client GTC order has not been cancelled or executed during this period, it will automatically expire on the one-year anniversary. A daily file containing expired GTC/GTD orders can be provided upon request to Help@virtu.com.

AON (All-or-None) Orders: An AON order is a special order type that is offered by VAL. AON orders are not accepted by and cannot be routed to Exchanges or other external marketplaces. AON orders must be filled in a single execution at one price for the entire amount of the order. Accordingly, AON orders may require manual facilitation by a trader. Given the special handling instructions, AON orders do not receive priority over market and marketable limit orders. AON orders can be cancelled unilaterally at any time before the full execution of the AON order in its entirety. This right of unilateral cancellation puts and keeps VAL at risk up until the full execution of the AON order.

FOK (Fill-or-Kill) Orders: A FOK order must be filled in a single execution at one price for the entire amount of the order and unlike the AON order, the FOK order will be executed by VAL upon receipt or canceled.

IOC (Immediate-or-Cancel) orders: VAL may at its discretion execute all or part of any IOC order. If the order is executed in whole or in part, the executed quantity will be executed at the current market in case of a Market IOC order or at the order's limit price in the case of a Limit IOC order. If the order is not executed or partially executed, the unexecuted quantity will be canceled. IOC orders are transient by definition and therefore do not receive Manning protection.

Held and Not Held Orders

Clients have the ability to indicate, via electronic messaging protocol or otherwise, whether orders routed to VAL should be handled as "held" or "not held." When a client enters a "not held" order with VAL the client is giving VAL discretion to use its professional judgment on the timing and pricing of the



executions. At times, VAL may execute trades for itself or for other clients at prices for which a “not held” order could be executed but VAL may choose not to execute the order at these price(s). Should the client choose not to provide instructions when routing its order to VAL, orders may be handled as either “held” or “not held,” as determined by VAL, dependent upon the order workflow utilized. In some instances, the marking of an order as “held” may be inconsistent with the expected handling of the order and in those circumstances, VAL may handle the orders as a “Not Held Order” and record in its records the order instruction as “Not Held”.

Special Settlement

VAL accepts requests for special settlement orders (e.g., cash, next-day, extended, shortened, etc.).

- Upon receipt of each special settlement order, but prior to the Firm’s acceptance of each such order, VAL will check for upcoming corporate actions in the stock.
- Research and manual handling of the order could delay the process and affect the execution price during times of market volatility.
- The executed price of special settlement orders may reflect the Firm’s compensation, including an imputed mark-up or mark-down.
- VAL reserves the right to refuse to accept any special settlement (i.e., Non- Regular-Way) orders.

Reg NMS Rule 612 and Invalid Order Prices

For orders priced above \$1.00, any priced order that VAL receives with a price containing more than two decimal places (e.g., 10.123, 10.125, 10.0625, 10-1/8, etc.) will be rejected for invalid price. Orders in NMS securities with prices that are not evenly divisible by the current unit of trading, i.e., \$.01, are automatically rejected. For orders priced below \$1.00, any priced order that VAL receives with a price containing more than four decimals places will be rejected.

Limit Order Display- NMS Stocks

Upon receipt of a display eligible client limit order in NMS securities, depending on whether the market has opened or not, VAL will generally route a limit order, as principal, to the Primary Exchange for participation in the opening cross or, following the opening cross, to an Exchange, which may or may not be the Primary Exchange, for display. VAL considers cost and rebates as factors in choosing where to send limit orders for display. To the extent that the routed limit order is executed on an Exchange, VAL will execute the corresponding client limit order at the same price up to the amount executed on the Exchange.

Limit Order Display – OTC Markets Stocks

For OTC Securities, VAL displays Limit Orders in the following manner.

- Generally, Limit Order Display (“LOQD”) commences at 9:30am ET and continues until 4:00 pm ET.
- Eligible orders will be displayed for a share amount at least equal to the minimum quotation size (MQS) requirement (see chart below), with any remaining balance held in reserve. The full size of eligible orders will be displayed as required by FINRA Rule 6460.



- Orders with quantities or with leave quantities that are below the MQS will not be eligible for LOQD unless they can be aggregated with other open client orders at the same price to meet the MQS.
- Orders will receive full price display to a maximum of four (4) decimal places.
- Orders will be displayed in accordance with FINRA Rule 6433 Quote Tiers (see chart below).
- Orders with restrictions (e.g., AON, Stop Orders) or special handling instructions (e.g., not-held) are not eligible for LOQD.
- Grey Market and non-piggyback qualified OTC securities are generally not eligible for LOQD.
- The limit order quote display process assumes normal market and system conditions.
- Order display may be affected by the level of quoting activity.

Minimum Quote Size (MQS)

Price	Min Quote Size
.0001 – .0999	10,000
.10 – .1999	5,000
.20 – .5099	2,500
.51 – .9999	1,000
1.0 – 174.99	100
175 +	1

Minimum Price Increment (Quote Tiers)

Quote Prices	Quote Tick
<\$0.0001	0.000001 (rank or accept only, but not display)
>=\$.0001 - \$.9999	0.0001
>=\$1	0.01

IPO Pre-Opening Protocols

VAL generally accepts orders for new issues prior to the opening of secondary trading of an Initial Public Offering (IPO). In NMS securities, VAL routes principal representative orders to the Primary Exchange which are handled pursuant to the Exchange's opening procedures. Executions are provided to client orders, typically on a riskless principal basis.

Pre-opening orders are subject to the following terms and conditions:

- All orders submitted to VAL in IPO Securities prior to the opening cross on the Primary Exchange must be submitted with a limit price. In accordance with FINRA Rule 5131, VAL does not accept market orders for the purchase of shares of a new issue in the secondary market prior to the commencement of trading of such shares in the secondary market. Similarly, VAL will not accept any modifications to an order that would change an IPO pre-opening limit order into a market order.
- The following order types are also not eligible: AON, Stop Quote and Stop Loss orders and pre-market, after-hours, or all day trading orders.



- VAL will attempt to reject market and similar impermissible order types submitted in IPO stocks prior to the opening cross. Whether rejected or not, VAL will deem these orders as invalid and these orders will not be considered for execution.
- VAL will use reasonable efforts to facilitate the execution of orders in IPO Securities received prior to the opening cross. VAL's ability to provide the opening price is in part dependent on the sufficient liquidity at the Primary Exchange to satisfy the interest VAL has submitted to the Exchange. Accordingly, VAL does not guarantee that every order transmitted to it will be executed at the opening price.
- Paired orders sent to VAL (where you send the buy and sell in the same stock) may not both receive an execution at the opening price.
- Any pre-opening order transmitted to VAL which does not receive an execution at the opening price will be handled as a regular Day Order pursuant to VAL's post-opening order handling protocols.
- Orders received immediately prior to the opening of secondary trading may be too late to receive execution at the Primary Exchange opening price.

Fractional and Notional Orders

Fractional and Notional Orders are non-standard order types that are accepted by VAL but require special handling given the nature of the order. This is due to additional operational processes including those required to calculate share quantities and execute the order. As a result, Fractional and Notional Orders routed to VAL will be handled on a "not held" basis. It should be noted that Fractional and Notional Orders routed to VAL may not be handled in the same queue priority nor at the same speed as standard market or limit orders where share quantity is known. These orders may not participate in opening, closing, or volatility auctions. As these orders require special handling by our systems, there may be execution delays which can result in these orders receiving prices that significantly deviate from the last sale and or NBBO at the time of order arrival or at the time the order becomes marketable. These delays may be more pronounced immediately after the open and or during and following volatility halts. While the Firm will make reasonable efforts to continue handling Fractional and Notional Orders during non-normal market conditions, the Firm reserves the right to stop handling Fractional and Notional Orders when we determine market conditions are non-normal. Fractional and Notional orders in IPO Securities will not be accepted on the day of the IPO.

Where a Notional Order is determined to be non-marketable, the Firm may attempt to display an approximated order size based on the notional amount of the order and the limit price.

Opening Only (OPG) Orders

Opening Only orders with an "OPG" qualifier will be accepted up until the relevant Exchange cut-off time, and will be eligible for execution based on the opening price/print on the stock's Primary Exchange based on the Exchange's opening auction process. Please note that OTC Securities do not have an official opening cross.

- OPG orders received after the cut-off time will not receive executions. Generally, a "too-late-to-enter" (TLTE) administrative message will be returned to the order-sending firm. Whether or not the administrative message is returned, the order will be deemed invalid and not accepted.
- OPG order cancellation requests received after the cut-off time will not be honored. Typically, a "too-late-to-cancel" (TLTC) administrative message will be returned to the order-sending



firm. Whether or not the administrative message is sent, cancellation requests received after the cut-off time will not be honored.

- OPG orders, or the balance remaining of an OPG order, that are not executed at the opening, are deemed cancelled and are not eligible for execution in the continuous market. Typically, the Firm will automatically cancel the order and confirm the cancellation back to the order-sending firm (typically through an electronic "Cancel by Market Maker" administrative message).
- For IPOs, follow on offerings, and other circumstances in which the security opens at times later than the beginning of normal trading hours, the Firm may choose not to accept orders with an OPG instruction. In the event the Firm accepts an order with an OPG instruction the Firm does not guarantee execution of such orders.

Order Handling Protocols at the Open

- An "Open" refers to the process during which VAL facilitates client orders for participation in a security's opening auction (or other opening process) with the intent for execution at the price of the Opening Print as determined at the stock's Primary Exchange.
- Only Day and all day trading market and limit orders may be eligible to participate in the open. All other order types that VAL accepts are not eligible.
- To facilitate the execution of a client order at the Open, VAL submits a principal representative order to the Exchange. Accordingly, acceptance and execution of these orders is subject to the Primary Exchange's rules and protocols, particularly as it relates to cut-off times for order acceptance and cancellation. Orders which are received after the relevant Exchange cut-off will not be eligible for the Open and will be handled in accordance with the Firm's order handling protocols described in this document.
- Stocks may begin trading on other market centers prior to the official opening print, particularly if the Primary Exchange's opening is delayed. Generally, VAL will not execute these orders until the Opening Print. Clients may elect to have orders sent after 9:30 am but prior to the official open executed prior to the Opening Print. Please contact your Sales Representative if you prefer to have eligible orders executed prior to the open at prices which may differ from the Primary Exchange's opening print.
- Limit order protection (Manning) and quote display is provided to any eligible pre-open DAY, ADT, GTC or GTD order that remains unfilled after the opening auction until such time as the Primary Exchange's auction price is established and disseminated to the market.

Order Handling Protocols at the Open- OTC Securities

Please note OTC Securities do not have an official opening cross. The Firm handles and executes orders received prior to 9:30 am pursuant to the Firm's regular order handling protocols for OTC Securities. As described above, most orders in OTC Securities are handled manually by the Firm's traders and are not subject to the Firm's automated execution protocols for NMS Securities.

Market-on-Close (MOC)/Limit-on-close (LOC) Orders & Cancellations

VAL handles client orders in NMS securities with MOC or LOC instructions by routing representative principal orders to the Primary Exchange. These principal orders are subject to the terms and conditions of the Exchange, including the Exchange's rules limiting the time that such orders may be entered, modified or canceled (relevant "cut off" times). Accordingly, VAL accepts MOC/LOC orders



from clients subject to the same terms and conditions as the Primary Exchange and orders transmitted too close to the cut-off time may not be eligible to participate in the Exchange's closing auction. Please note that OTC Securities do not have an official closing cross.

VAL will not accept an MOC/LOC order with additional order handling instructions (including, but not limited to AON, IOC, and FOK, etc.). These orders are deemed invalid and not accepted.

Stop Orders and VAL's Quote-Stop Orders

VAL offers two ways for customer stop orders to be executed:

1. "Stop Orders" and "Stop Limit Orders" as defined by FINRA: FINRA defines a stop order as an order to buy (or sell) that becomes a market order to buy (or sell) when a transaction occurs at or above (below) the stop price. A "stop limit order" is an order to buy (or sell) that becomes a limit order to buy (or sell) at the limit price when a transaction occurs at or above (below) the stop price.
2. VAL's "Quote-Stop Orders" and "Quote-Stop Limit Orders:" VAL offers a Quote Stop Order which it defines as an order to buy (or sell) that becomes a market order to buy (or sell) when a Quote occurs at or above (below) the stop price. A "Quote Stop Limit Order" is an order to buy (or sell) that becomes a limit order to buy (or sell) at the limit price when a Quote occurs at or above (below) the stop price.

Generally, VAL handles elected stop orders through a process that is automated for most orders and manual for others, including all OTC Securities. If a triggering event, either an electing quote or last sale, elects only a single stop type order then that stop order will be handled on an automated basis without intervention by a trader unless the order is expected to have material price impact. If the single elected stop order is expected to have material price impact it will be handled manually by a VAL trader. VAL endeavors to execute elected stop orders that are marketable fully and promptly. VAL generally will not know in advance whether your order will be handled on a fully automated basis or manually by a VAL trader. Fully automated orders will typically execute more quickly than orders handled manually by traders.

Alternatives for Election

VAL will utilize Quotes as the default trigger for stop orders as described above, unless the client requests and VAL agrees to accept "Stop Orders" and "Stop Limit Orders" in writing. In general, once a client requests a change, the new trigger method will apply to all subsequent orders received from that client.

Conditions for Acceptance of Quote-Stop and Quote-Stop Limit Orders

The Quote-Stop price of a Sell Quote-Stop Order or of a Sell Quote-Stop Limit Order must be equal to or below the National Best Bid when received (otherwise it will be rejected). The Quote- Stop price of a Buy Quote-Stop Order or of a Buy Quote-Stop Limit Order must be equal to or above the National Best Offer when received (otherwise it will be rejected). In addition, because Quote-Stop Orders may be triggered only during normal market hours, Quote-Stop Orders with a pre-market, after hours, or all day trading instruction will be rejected. Quote- Stop Orders with the IOC or FOK condition will also be rejected.



Trailing Quote-Stop Order Handling

VAL will accept trailing Quote-Stop Orders in which a Quote-Stop parameter (designated by points or percentage) is used to create an activation price that moves along with fluctuations of the stock.

Election of Quote-Stop Orders

Sell Quote-Stop Orders and Sell Quote-Stop Limit Orders are elected when the National Best Bid meets or falls below the Quote-Stop price. Buy Quote-Stop Orders and Buy Quote-Stop Limit Orders are elected when the National Best Offer meets or exceeds the Quote-Stop price. All Sell/Buy Quote-Stop and Sell/Buy Quote-Stop Limit Orders are elected immediately upon receipt if the Quote-Stop price is equal to the National Best Bid/Offer.

Note: All Quote-Stop and Quote-Stop Limit orders received in the Pre-Open are accepted. The earliest such orders may be elected is at or after the open upon publication of the first unlocked, uncrossed National Best Bid/Offer.

Note: A National Best Bid/Offer that would otherwise elect a Quote-Stop stop price will not elect that stop price if that Bid/Offer is part of a Locked or Crossed Market.

Time of Receipt of Elected Quote-Stop Orders

After being elected, a Quote-Stop Order becomes a market order. For the purpose of determining time of receipt, as compared to other market orders, the time the Quote-Stop Order is elected is the receipt time of the resultant market order.

Time of Receipt of Elected Quote-Stop Limit Orders

After being elected, a Quote-Stop Limit Order becomes a limit order. For the purpose of determining time of receipt as compared to other limit orders, the time the Quote-Stop Limit Order is elected is the receipt time of the resultant limit order.

Conditions for Acceptance of Stop and Stop Limit Orders (as defined by FINRA)

The Stop price of a Sell Stop Order or of a Sell Stop Limit Order must be equal to or below the National Best Bid when received (otherwise it will be rejected). The Stop price of a Buy Stop Order or of a Buy Stop Limit Order must be equal to or above the National Best Offer when received (otherwise it will be rejected). In addition, because Stop Orders may be triggered only during normal market hours, Stop Orders with an pre-market, after-hours, or all day trading condition will be rejected. Stop Orders with the IOC or FOK condition are also rejected.

Trailing Stop Order Handling

VAL will accept trailing Stop Orders in which a Stop parameter (designated by points or percentage) is used to create an activation price that moves along with fluctuations of the stock.

Election of Stop Orders



Sell Stop Orders and Sell Stop Limit Orders are elected when the price of a published last-sale transaction that is not outside the current National Best Bid/Offer falls below the Stop price. Buy Stop Orders and Buy Stop Limit Orders are elected when the price of a published last-sale transaction that is not outside the current National Best Bid/Offer price exceeds the Stop price.

Notes: All Stop and Stop Limit orders received in the Pre-Open are accepted. The earliest such orders may be elected is at or after the open upon publication of the first last-sale transaction that is not outside the current National Best Bid/Offer and that is not an odd-lot (as determined by the price of the security in accordance with Reg NMS Rule 600).

A published last-sale transaction that would otherwise elect a Stop price will not elect that Stop price if that last-sale transaction is published during a Locked or Crossed Market.

Time of receipt of Elected Stop Orders

After being elected, a Stop Order becomes a market order. For the purpose of determining the time of execution, as compared to other market orders, the time the Stop Order is elected is the receipt time of the resultant market order.

Time of Receipt of Elected Stop Limit Orders

After being elected, a Stop Limit Order becomes a limit order. For the purpose of determining the time of receipt as compared to other limit orders, the time the Stop Limit Order is elected is the receipt time of the resultant limit order.

Order Handling Disclosures

FINRA Rule 5320 (Manning)

VAL conducts trading activities across independent Trading Units that utilize information barriers designed to prevent a Trading Unit from obtaining knowledge of client orders held by a separate Trading Unit. Accordingly, VAL may trade for its own account in a Trading Unit at a price that would satisfy a client order resting in another VAL Trading Unit without providing an execution to that resting client order. The Firm has implemented internal controls designed to prevent its separate Trading Units from obtaining knowledge of the open client orders handled by other Trading Units.

VAL handles customer market and customer aggressive limit orders in a Trading Unit that has no knowledge of orders being handled by its other Trading Unit(s) (i.e. resting limit orders, over-sized orders, orders with special handling instructions). Consequently, market orders and aggressive limit orders handled in one Trading Unit will not cross with resting limit orders held within the other Trading Unit.

During normal market conditions, within the same Trading Unit, principal executions are applied to eligible client orders via VAL's Manning process – first to eligible limit orders in price-time priority, and then to eligible market and aggressive limit orders – in first-in, first-out (FIFO) priority. Aggressive limit orders may receive protected price-time priority if they cease being aggressive prior to execution due to market movements. Certain market or aggressive limit orders may not receive an execution via the Manning process if the order has been routed to the market and is expected to receive an execution that will be applied to that order.



Client orders with special handling conditions are not eligible for Manning protection if the order is a transient IOC or if an execution via Manning would conflict with the order instructions, for example, orders with an Opening condition (MOO/LOO/OPG) or Closing condition (MOC/LOC/CLO). In addition, certain principal orders of VAL that are submitted to an Exchange Opening auction (MOO/LOO) will be applied via Manning only to those eligible client orders, if any, that were received before the time that the VAL order was no longer able to be modified or cancelled with the Exchange.

Order Routing

VAL utilizes proprietary smart router technology to access liquidity on other market centers, including for the purpose of filling clients' orders. These market centers can include ATSS operated by VAL, other ATSS, other market makers, and Exchanges. The sequence of routing changes from time to time but generally is designed such that the router will seek price improvement opportunities, in some cases rebates, and route to lower cost destinations earlier in the sequence and will route orders that cross the spread on higher cost destinations later in the sequence. VAL's own ATS is generally first in the sequence. The sequence may differ depending on clients' sensitivity to Reg NMS Rule 605 statistics. The Firm rests principal limit orders to represent a client's limit order on venues that pay a rebate for such orders and often chooses the venue paying the highest rebate. The Firm receives volume discounts from market centers that offer such discounts. The Firm also receives orders from market centers and trading centers to which it routes orders. To the extent the Firm receives rebates in connection with the routing of orders, those rebates contribute to the Firm's revenues. The Firm may have a direct or indirect ownership interest in market centers and trading centers to which it chooses to route orders. Currently, Virtu operates the POSIT and MatchIt ATSS and has interests in the parent companies of MEMX and MIAAX.

Securities Listed on Non-U.S. Exchanges

Orders received from clients in non-U.S. securities may be routed to a foreign Exchange or foreign broker, including to a Virtu affiliate, for execution. These executions are handled on a "net" basis, therefore the reported price may reflect transaction, handling and/or currency Exchange fees associated with the execution. VAL may also receive payment for order flow for your orders in non-U.S. securities.

Positioning Activities in Connection with Stop Orders

VAL can engage in positioning activities to acquire a long or short position in order to provide liquidity to elected stop orders. Positioning activity may take place prior to the election of stop orders or subsequent to the election of stop orders. The Firm's transactions may contribute to an increase/decrease in the stock's price, which in turn could increase/decrease the likelihood a stop order being elected and may affect the final price received on a stop. VAL will make reasonable efforts to balance the Firm's and our clients' interests when engaging in positioning activity with a view towards providing fair pricing in such instances.

Not Held Orders & Net Trades

Most broker-dealer clients do not pay a disclosed commission for VAL to execute "not held" orders. Instead, VAL executes "not held" orders on a "net" basis. When executing "not held" orders on a "net" basis, VAL will accumulate a position in a principal account to fill your order and then execute your order at a price(s) that is above its average accumulation cost in the case of a buy order or below its average accumulation cost in the case of a sell order. The difference between VAL's average cost to



accumulate a position to fill your “not held” order and the price reported to you and the consolidated tape is compensation to VAL for the execution of your order. The amount of this compensation is not separately disclosed. Details regarding the individual executions used to fill your order(s) are available upon request.

Hybrid Trading Workflow

For orders entered with the Firm utilizing a hybrid trading workflow, members of the Firm’s customer market making team may interact with your orders from time-to-time to assess the instructions of the order in comparison to the market for the security. This is done in an effort to apply trading expertise to these orders and improve overall execution experience. Please note that orders that you have routed to the Firm through this workflow are received on a “not held” basis and therefore are not eligible for the Firm’s Manning process.

Orders Entered Outside of Regular Trading Hours

Purchase and sale of securities outside of regular market hours may entail special risks, including the following:

1. **Lower Liquidity:** Liquidity refers to the availability of shares in the marketplace. Generally, the more orders that are available in a market, the greater the liquidity. Greater liquidity usually makes it easier for investors to buy or sell securities. There may be less liquidity during extended hours than during market hours. As a result, an order may only be partially executed or not at all.
2. **Higher Volatility:** Volatility refers to the amount that a security's price changes over time. Generally, the higher the volatility of a security, the greater are its price swings. There may be greater volatility during extended hours than during market hours. As a result, an order may only be partially executed or not at all, and/or an order may receive a price during extended hours that it would not have received during market hours.
3. **Wider Spreads:** The spread refers to the difference in price between the inside bid and offer in a security. Lower liquidity and higher volatility tend to result in wider than normal spreads.
4. **Prices Unrelated to Normal Market Hours Prices:** The price of a security traded during extended hours may reflect neither its prior closing price nor its subsequent opening price. As a result, an order may receive a price during extended hours that is unrelated to a price it would have received during market hours. These overnight venues typically employ price bands relative to a last sale price occurring during a prior session for individual securities. However, clients should note that for trading occurring on overnight ATs, each venue may have their own procedures for determining that a clearly erroneous trade has occurred. Clients should be aware of the clearly erroneous procedures on these venues as some may apply time constraints on the timing of filings. SRO clearly erroneous guidelines may not be enforced for executions occurring during the overnight sessions.
5. **Unlinked Markets:** Given that there is currently no SIP available in the extended hours, prices of a security displayed on a particular extended hours trading system may not reflect the prices of the same security displayed in other concurrently operating extended hours trading systems.



Accordingly, an order may receive a price in one extended hours trading system that it would not receive in another extended hours trading system.

6. New Information: Corporate news and financial information are generally disseminated aftermarket hours. Such announcements, especially when combined with lower liquidity and higher volatility, can have an exaggerated effect on the price of a security.

Market Access Controls

SEC Rule 15c3-5 requires that broker dealers maintain risk management controls and supervisory procedures ("Risk Controls") related to their access to Exchanges and alternative trading systems. These Risk Controls are required to address both financial and regulatory risk. As a result, VAL may delay the processing of any order, or orders, should those orders invoke pre-trade risk control thresholds in place at that time. The delay provides the Firm the opportunity to evaluate the order(s) and determine how it should be handled or whether it should be rejected. VAL will not be liable for any loss resulting from delays or rejections occurring as a result of the Firm's Risk Controls.

Reserved Rights

VAL reserves the right, at its sole discretion, to modify, suspend, or cancel any of its order handling protocols, (except those that are designed to ensure compliance with the Firm's regulatory obligations), including, but not limited to, automated price improvement and automatic execution, without notice on a stock by stock or on a client by client basis, when non-normal market conditions exist, when attempts are made to abuse or circumvent its automatic execution size limitations, or when VAL otherwise deems it appropriate.

VAL reserves the right at its sole discretion to offer various execution services to clients (e.g., Auto-Ex, Price Improvement, Pre/Post Market Trading, etc.) on a client specific basis. The Firm reserves the right to reject all or any orders on a client-by-client and/or symbol-by-symbol basis at any time and for any reason related to its risk controls, whether financial, regulatory or other, as determined by VAL in its sole discretion.

VAL requests that clients obtain approval prior to placing any order that is being sold pursuant to a registration statement or an offering exemption contained in Section 4 of the 33 Act or SEC Rule thereunder such as SEC Rule 144, or other similar statute or rule. VAL reserves the right to refuse to execute any such order or to break trades if prior approval has not been obtained.

Other

In the United States securities products and services are offered by VAL which is a wholly owned broker-dealer subsidiary of Virtu Financial, Inc. Clients should familiarize themselves with these protocols and other protocols and disclosures made by VAL and its affiliates which may be found on the Virtu Financial's website: <https://www.virtu.com/regulatory-disclosures/>.

While this Order Handling Protocol document is intended to be a guideline as to how orders routed to the Firm will be handled, please refer to the most recent FIX Technical Specifications for any specifics and guidelines as to how orders must be marked or submitted in order to receive the handling specified herein.



VAL is a member of FINRA, SIPC, most Exchanges and clearinghouses in the United States, and is registered as a Floor Trader Firm with the National Futures Association (“NFA”).

Based on the services provided by VAL, the Firm would not expect to receive personally identifiable information (“PII”), nor does it use or want PII. Counterparties should not transmit PII of their customers to VAL unless required by law, rule, or regulation.