sections 6(c) and 17(b) of the Act from the prohibition on certain affiliated transactions in section 17(a) of the Act to the extent necessary to permit the Underlying Funds to sell their shares to, and redeem their shares from, the Funds of Funds.[4] Applicants state that such transactions will be consistent with the policies of each Fund of Funds and each Underlying Fund and with the general purposes of the Act and will be based on the net asset values of the Underlying Funds.

2. Applicants agree that any order granting the requested relief will be subject to the terms and conditions stated in the application. Such terms and conditions are designed to, among other things, help prevent any potential (i) undue influence over an Underlying Fund that is not in the same ''group of investment companies'' as the Fund of Funds through control or voting power, or in connection with certain services, transactions, and underwritings, (ii) excessive layering of fees, and (iii) overly complex fund structures, which are the concerns underlying the limits in sections 12(d)(1)(A), (B), and (C) of the Act.

3. Section 12(d)(1)(J) of the Act provides that the Commission may exempt any person, security, or transaction, or any class or classes of persons, securities, or transactions, from any provision of section 12(d)(1) if the exemption is consistent with the public interest and the protection of investors. Section 17(b) of the Act authorizes the Commission to grant an order permitting a transaction otherwise prohibited by section 17(a) if it finds that (a) the terms of the proposed transaction are fair and reasonable and do not involve overreaching on the part of any person concerned; (b) the proposed transaction is consistent with the policies of each registered investment company involved; and (c) the proposed transaction is consistent with the general purposes of the Act. Section 6(c) of the Act permits the Commission to exempt any persons or transactions from any provision of the Act if such exemption is necessary or appropriate in the public interest and consistent with the protection of investors and the purposes fairly intended by the policy and provisions of the Act.

For the Commission, by the Division of Investment Management, pursuant to delegated authority.

Eduardo A. Aleman,

Assistant Secretary.

[FR Doc. 2017–03297 Filed 2–17–17; 8:45 am]

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[4] A Fund of Funds generally would purchase and sell shares of an Underlying Fund that operates as an ETF through secondary market transactions rather than through principal transactions with the Underlying Fund. Applicants nevertheless request relief from section 17(a) to permit a Fund of Funds to purchase or redeem shares from the ETF. A Fund of Funds will purchase and sell shares of an Underlying Fund that is a closed-end fund through secondary market transactions at market prices rather than through principal transactions with the closed-end fund. Accordingly, applicants are not requesting section 17(a) relief with respect to transactions in shares of closed-end funds (including business development companies).

SECURITIES AND EXCHANGE COMMISSION

[Release No. 34–80041; File No. SR–CHX–2017–04]

Self-Regulatory Organizations; Chicago Stock Exchange, Inc.; Notice of Filing of Proposed Rule Change To Adopt the CHX Liquidity Enhancing Access Delay

February 14, 2017.

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 (''Act'')[1] and Rule 19b–4 thereunder,[2] notice is hereby given that on February 10, 2017, the Chicago Stock Exchange, Inc. (''CHX'' or ''Exchange'') filed with the Securities and Exchange Commission (the ''Commission'') the proposed rule change as described in Items I, II and III below, which Items have been prepared by the self-regulatory organization. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

I. Self-Regulatory Organization's Statement of the Terms of Substance of the Proposed Rule Change

CHX proposes to amend the Rules of the Exchange (''CHX Rules'') to adopt the CHX Liquidity Enhancing Access Delay. The text of this proposed rule change is available on the Exchange's Web site at *http://www.chx.com/regulatory-operations/rule-filings/,* at the principal office of the Exchange, and at the Commission's Public Reference Room.

II. Self-Regulatory Organization's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, the self-regulatory organization included statements concerning the purpose of, and basis for, the proposed rule change and discussed any comments it received on the proposed rule change. The text of those statements may be examined at the places specified in Item IV below. The Exchange has prepared summaries, set forth in sections A, B and C below, of the most significant parts of such statements.

A. Self-Regulatory Organization's Statement of the Purpose of, and the Statutory Basis for, the Proposed Rule Change

1. Purpose

(1) Overview

The Exchange proposes to amend the CHX Rules to adopt the CHX Liquidity Enhancing Access Delay (''LEAD''). In sum, LEAD will require all new incoming orders, cancel and cancel/replace messages to be subject to a 350-microsecond intentional access delay; provided, however, that (1) new incoming orders[3] submitted by LEAD Market Makers (''LEAD MM''), a new class of CHX Market Maker[4] with heightened quoting and trading obligations, that would be immediately ranked on the CHX book without executing against any resting orders on the CHX book and (2) certain cancel messages related to resting orders that were submitted by LEAD MMs will not be delayed. LEAD will be applied to all securities traded on the Exchange throughout the trading day.[5] LEAD is designed to enhance displayed liquidity and price discovery by minimizing the effectiveness of latency arbitrage strategies that diminish displayed liquidity and impair price discovery, as described in detail below.

(2) Latency Arbitrage

As used herein, ''latency arbitrage'' means the practice of exploiting

[1] 15 U.S.C. 78s(b)(1).

[2] 17 CFR 240.19b–4.

[3] ''New incoming orders'' are orders received by the Matching System for the first time. As discussed below, LEAD will not apply to other situations where existing orders or portions thereof are treated as incoming orders, such as (1) resting orders that are price slid into a new price point pursuant to the CHX Only Price Sliding or Limit Up-Limit Down Price Sliding Processes and (2) unexecuted remainders of routed orders released into the Matching System. *See* CHX Article 1, Rule 2(b)(1)(C); *see also* CHX Article 20, Rule 2A(b); *see also* CHX Article 20, Rule 8(b)(7). Incidentally, the Exchange is proposing to amend CHX Article 20, Rule 8(a)(7) to delete the word ''new'' from the last sentence, so that the rule provides, in pertinent part, that if no balance exists at the time a part of an unexecuted remainder of a routed order is returned to the Matching System, it shall be treated an incoming order.

[4] *See* CHX Article 1, Rule 1(tt) defining ''Market Maker''; *see also generally* CHX Article 16 (Market Makers).

[5] Each trading day is divided into four trading sessions: Early session, regular trading session, late trading session and late crossing session. *See* CHX Article 20, Rule 1(b). The Exchange only accepts cross orders during the late crossing session and thus does not accept or rank any single-sided orders during the late crossing session. *See* CHX Article 1, Rule 2(a)(2) defining ''cross order.''

disparities in the price of a security or related securities that are being traded in different markets by taking advantage of the time it takes to access and respond to symmetric public information.[6] At CHX, latency arbitrage is effected by low-latency market participants that leverage microsecond speed advantages to take resting liquidity at stale prices from the CHX limit order book.

In 2016, the Exchange experienced a material decline in CHX volume and liquidity in the SPDR S&P 500 trust exchange-traded fund (''SPY''),[7] which the Exchange has attributed to latency arbitrage activity in SPY first observed at CHX in January 2016 (''SPY latency arbitrage activity'').[8] Specifically, during the period of January through July 2016, the Exchange observed unusual messaging patterns in SPY whereby an execution of a large inbound Immediate Or Cancel order (''IOC'') against a contra-side order resting on the CHX book was frequently followed by a late cancel message for the executed resting order soon after the execution (''Too Late to Cancel'' or ''TLTC'').[9] Based on these observations, Participant corroboration of the observations and market data analysis,[10] the Exchange found that SPY latency arbitrage activity caused CHX liquidity providers to dramatically reduce displayed liquidity in SPY (and at times withdraw from the market altogether), which materially decreased liquidity in SPY market wide, especially in light of CHX's significant contributions to overall volume and liquidity in SPY prior to the declines.[11]

As demonstrated by the SPY latency arbitrage activity, latency arbitrage imposes a tax on liquidity provision [12] that dissuades market participants from providing displayed liquidity, which is incompatible with a primary goal of Regulation NMS to enhance displayed liquidity to the benefit of investors and the public interest.[13] Latency arbitrageurs exploit the fact that updating the continuous limit order book (utilized by every national securities exchange) necessarily requires the processing of order-related messages serially by time of receipt. Thus, when reacting to the same symmetric information, a liquidity provider with a quote displayed on an exchange must be faster than a latency arbitrageur to avoid its stale quote from being executed.[14] This structural bias facilitates the ability of the latency arbitrageur to extract profits from symmetric information.[15] The Exchange submits that this bias is contrary to a fundamental principal of trading, that the parties agree upon the terms of the trade, and permitting latency arbitrage to continue to diminish displayed liquidity is wholly inconsistent with the objectives of Regulation NMS.[16]

(3) LEAD

LEAD is designed to offset the structural bias that unfairly favors latency arbitrageurs by giving liquidity providers who have committed to heightened quoting and trading requirements (*i.e.,* LEAD MMs) a small head start to the cancellation of stale quotes in the race to react to symmetric public information.[17] Based on its analysis of CHX market data,[18] the Exchange does not believe that LEAD will have a material impact on the ability of liquidity takers not engaged in latency arbitrage, such as retail investors, to access displayed liquidity at CHX.[19] To the extent a sophisticated market participant seeks to take displayed liquidity pursuant to better or different information (as opposed to the same information exploited by latency arbitrageurs), LEAD is too short to have an incrementally negative impact on such non-latency arbitrage strategies.

The LEAD MM is a new class of CHX Market Maker that will be subject to the proposed Minimum Performance Standards, as described in detail below, which will not be applied to non-LEAD MMs. The purpose of the Minimum Performance Standards is to ensure that LEAD MMs will be required to meet heightened quoting and trading requirements in return for undelayed access to the CHX book for the purposes of submitting liquidity providing orders and cancelling its resting orders. Also, LEAD MMs will be required to establish at least one LEAD MM Trading Account, as described below, through which all LEAD market making activities must originate.

Specifically, LEAD will require the following messages in all securities

[6] *See* Letter to Brent J. Fields, Secretary, SEC, from Eric Budish, Professor of Economic and David G. Booth Faculty Fellow, the University of Chicago Booth School of Business (October 13, 2016) (''Budish LTAD Letter'') at 2. Given its emphasis on speed, latency arbitrage has resulted in a well-documented and escalating technology race among certain market participants seeking to obtain ever smaller speed advantages. *See* Eric Budish, Peter Cramton and John Shim, ''The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response,'' *Quarterly Journal of Economics,* Vol. 130(4), November 2015 (''Budish Paper''); *see also,* Elaine Wah and Michael Wellman, ''Latency Arbitrage, Market Fragmentation, and Efficiency: A Two-Market Model,'' *4th ACM Conference on Electronic Commerce,* June 2013.

[7] Most of the CHX liquidity in SPY and other S&P 500-correlated securities is provided as part of an arbitrage strategy between CHX and the futures markets, whereby liquidity providers utilize, among other things, proprietary algorithms to price and size resting orders on CHX to track index market data from a derivatives market (*e.g.,* E-Mini S&P traded on the Chicago Mercantile Exchange's Globex trading platform).

[8] A detailed analysis (''CHX ETF Analysis'') of the impact of latency arbitrage on displayed liquidity in SPY at CHX, for the period of August 2015 through July 2016 (''Analysis Period''), may be found under Appendix A. The market data utilized by the CHX ETF Analysis, as well as defined terms and notes, may be found under Appendix B. Additional analysis regarding the potential impact of LEAD on liquidity takers may be found under Appendix C. As discussed in detail under Appendix A below, prior to the beginning of the SPY latency arbitrage activity in January 2016, CHX volume and liquidity in SPY constituted a material portion of overall volume and liquidity in SPY marketwide. For example, the CHX Market Share in SPY as a percentage of Total Volume decreased from 5.73% in January 2016 to 0.57% in July 2016, while the Control Securities did not experience similar declines. *See infra* Appendix A; *see also infra* Appendix B Calculation Set 1a. Also, the Time-weighted Average CHX Size At The NBBO in SPY relative to the total NMS Size At The NBBO in SPY decreased from 44.36% in January 2016 to 3.39% of the total NMS Size At The NBBO in SPY in July 2016, while the Control Securities did not experience similar declines. *See also infra* Appendix A; *see also infra* Appendix B Calculations Sets 3a and 4a.

[9] The Exchange did not begin maintaining TLTC data until May 2016. *See infra* Appendix C.

[10] *See supra* note 8.

[11] *See id.*

[12] *See* Eric Budish, Comment letter regarding ''Investors' Exchange LLC Form 1 Application (Release No. 34–75925; File No. 10–222)'' (February 5, 2016).

[13] The Commission has stated that ''increased displayed liquidity [is] a principal goal of the Order Protection Rule.'' Exchange Act Release No. 51808 (June 9, 2005), 70 FR 37496, 37514 (June 29, 2005) (''Regulation NMS Adopting Release''). The Commission has also stated that ''[t]o the extent that competition among orders is lessened, the quality of price discovery for all sizes of orders can be compromised. Impaired price discovery could cause market prices to deviate from fundamental values, reduce market depth and liquidity, and create excessive short-term volatility that is harmful to long-term investors and listed companies. More broadly, when market prices do not reflect fundamental values, resources will be misallocated within the economy and economic efficiency—as well as market efficiency—will be impaired.'' *Id.* at 37499.

[14] *See* Budish LTAD Letter, *supra* note 6, at 2.

[15] *See id.*

[16] *See* Regulation NMS Adopting Release, *supra* note 13, at 37514.

[17] *See* Budish LTAD Letter, *supra* note 6, at 2. In discussing possible alternatives to a frequent batch auction model for trading securities, the Budish Paper provides that ''the asymmetric delay eliminates sniping and stops the arms race.'' *See* Budish Paper, *supra* note 6, at 1612.

[18] Based on the Exchange's analysis of cancel activity in SPY at CHX for the period starting in May 2016 through July 2016, the Exchange believes that if LEAD had been implemented during that time period, out of a total of 18,316 partially-executed orders in SPY, 20 liquidity taking orders not attributed to latency arbitrage activity would have not been executed, a *de minimis* number in the light of the enhanced liquidity and price discovery afforded by LEAD. *See infra* Appendix C.

[19] The Exchange notes that while LEAD is designed to neutralize microsecond speed advantages exploited by latency arbitrageurs, LEAD MMs would still be required to obtain speed capabilities fast enough to take advantage of LEAD.

received by the Exchange throughout a trading day to be subject to a 350-microsecond intentional delay, the same length as the Investors Exchange LLC (''IEX'') POP/coil delay (''IEX Delay'') recently approved by the Commission,[20] before such delayed messages would be processed [21] by the Matching System: [22]

• All new incoming messages that did not originate from a Valid LEAD MM Trading Account, as described below, will be intentionally delayed; provided, however, that the portion of any new incoming Routable Order [23] that is to be routed away will never be delayed, regardless of who submitted the Routable Order.

• New incoming orders, as well as the replace portion of cancel/replace messages, that originate from a Valid LEAD MM Trading Account that would immediately execute against existing resting orders on the CHX book will be intentionally delayed.

• Cancel and cancel/replace messages for orders that originate from a Valid LEAD MM Trading Account that have been delayed, but not yet processed by the Matching System, will be intentionally delayed.

As such, the following messages would not be intentionally delayed pursuant to LEAD:

• New incoming orders that originate from a Valid LEAD MM Trading Account that would immediately be ranked on the CHX book without executing against existing resting orders on the CHX book will not be intentionally delayed.

• A cancel message for a resting order that originates from a Valid LEAD MM Trading Account will not be intentionally delayed.

• A cancel/replace message related to a resting order that originates from a Valid LEAD MM Trading Account will not be intentionally delayed; provided, however, that if any part of the replace portion would immediately execute against an existing resting order on the CHX book, the replace portion will be intentionally delayed.

• The portion of a Routable Order that is to be routed away will not be intentionally delayed, regardless of who submitted the Routable Order.

Also, LEAD will not delay any outbound messages or market data.

The Exchange notes that adopting a symmetric delay and order types that would permit the Exchange to reprice resting orders based on undelayed market data, such as the IEX Delay and pegged order types, would not address latency arbitrage at CHX with respect to limit orders because the liquidity provision strategies utilized by CHX liquidity providers, which provide valuable liquidity to the market overall,[24] require cancellations or adjustments to resting limit orders pursuant to proprietary algorithms held by the CHX liquidity providers that could not be adequately replicated by CHX.[25] Also, as the Commission noted in the IEX Approval Order, a symmetric delay that delays all inbound messages would be ineffective in protecting resting limit orders from latency arbitrage.[26] However, the Exchange notes that both LEAD and the IEX Delay provide processing advantages to certain types of liquidity providers over all other order senders so as to minimize the effectiveness of latency arbitrage and are thus similar in this respect.[27]

Moreover, the Exchange submits that LEAD is consistent with the objectives of the Exchange Act and the rules and regulations thereunder. As described in detail below,[28] LEAD is, among other things, (1) a *de minimis* intentional access delay in that it is so short as to not frustrate the purposes of Rule 611 of Regulation NMS [29] by impairing fair and efficient access to an exchange's quotations; [30] (2) consistent with Rule 602(b) of Regulation NMS; [31] and (3) furthers the objectives of the objectives of Section 6(b)(5) of the Act in that it would protect investors and the public interest and does not unfairly discriminate among Participants.[32]

Amended Article 16, Rule 4 (Obligation of Market Makers)

Proposed Article 16, Rule 4(f) provides rules regarding the proposed LEAD MM Program. Specifically, proposed paragraph (f)(1) provides defined terms for the purposes of paragraph (f). Thereunder, proposed paragraph (f)(1)(A) provides that ''LEAD'' means the Liquidity Enhancing Access Delay, as described under proposed Article 20, Rule 8(h); proposed paragraph (f)(1)(B) provides that ''LEAD MM'' means a Market Maker assigned to a particular security that has committed to maintaining Minimum Performance Standards, described under proposed paragraph (f)(2), in the security; proposed paragraph (f)(1)(C) provides that ''LEAD MM Security'' means a security assigned to a LEAD MM; and proposed paragraph (f)(1)(D) provides that ''Qualified Executions'' means all executed shares at CHX, during all trading sessions,[33] resulting from single-sided orders, excluding any executed shares resulting from auctions.

Proposed paragraph (f)(2) provides that ''Minimum Performance Standards'' means the Quotation Requirements and Obligations described under current paragraph (d),[34] which provides the current quoting and pricing obligations for Market Makers, with the following modifications.[35]

Proposed paragraph (f)(2)(A) provides that the Designated Percentages described under current Article 16, Rule 4(d)(2)(B) shall be halved.[36] Thus, new incoming orders submitted by LEAD MMs will be required to be priced closer to the NBBO or the last reported sale in the security, as applicable, than those of current Market Makers.

In addition, LEAD MMs will be required to meet the following

[20] *See* Securities Exchange Act Release No. 78101 (June 17, 2016), 81 FR 41141 (June 23, 2016) (''IEX Approval Order''). The IEX Delay will delay all inbound order-related messages from IEX Users, outbound message confirmations to IEX Users and outbound market data disseminated through IEX's proprietary data feed. *See id.* at 41154. By not delaying inbound market data, IEX would be able to reprice its resting pegged orders to track changes to the NBBO before latency arbitrageurs could execute against such pegged orders at potentially stale prices, which facilitates the ability of IEX to comply with its rules regarding the repricing of pegged orders. *See id.* at 41155.

[21] For clarity, ''processed'' means executing instructions contained in a message, including, but not limited to, permitting an order to execute within the Matching System pursuant to the terms of the order or cancelling an existing order, whereas ''evaluate'' means the Matching System determining whether a message should be diverted into LEAD, as described below.

[22] The Matching System is an automated order execution system, which is a part of the Exchange's ''Trading Facilities,'' as defined under CHX Article 1, Rule 1(z).

[23] *See* CHX Article 1, Rule 1(oo) defining ''Routable Order.''

[24] *See supra* note 8; *see also infra* Appendices A and B.

[25] *See supra* note 7.

[26] *See* IEX Approval Order, *supra note* 20, at 41157.

[27] *See infra* Section 3(b).

[28] *See id.*

[29] 17 CFR 242.611.

[30] *See* Securities Exchange Act Release No. 78102 (June 17, 2016), 81 FR 40785 (June 23, 2016) (''Final Interpretation'').

[31] *See* 17 CFR 242.602(b).

[32] 15 U.S.C. 78f(b)(5).

[33] *See supra* note 5.

[34] The current Quotation Requirements and Obligations include, among other things, a continuous two-sided quote obligation and pricing obligations that require a continuous bid no further away from the National Best Bid (''NBB'') and a continuous offer no further away from the National Best Offer (''NBO'') than the Designated Percentage or Defined Limit, as applicable. *See* CHX Article 16, Rule 4(d).

[35] Trading days on which the Exchange does not open for trading, for whatever reason, will be excluded from the Exchange's calculations regarding compliance with the proposed Minimum Performance Standards.

[36] For example, the 8% Designated Percentage for securities subject to the Article 20, Rule 2A(c)(1)(A) pursuant to current CHX Article 16, Rule 4(d)(2)(A) and (B) would be 4% for LEAD MMs.

additional requirements. Proposed paragraph (f)(2)(B) provides that LEAD MMs shall maintain a Monthly Average NBBO Quoting Percentage, as defined thereunder, in each of its LEAD MM Securities, of at least 10% over the course of a calendar month. For each such security, the Exchange will determine: (i) The ''Daily NBB Quoting Percentage'' by determining the percentage of time the LEAD MM has at least one Round Lot [37] of displayed interest in an Exchange bid at the NBB during the Open Trading State [38] of each trading day for a calendar month; (ii) the ''Daily NBO Quoting Percentage'' by determining the percentage of time the LEAD MM has at least one Round Lot of displayed interest in an Exchange offer at the NBO during the Open Trading State of each trading day for a calendar month; (iii) the ''Average Daily NBBO Quoting Percentage'' for each trading day by summing the ''Daily NBB Quoting Percentage'' and the ''Daily NBO Quoting Percentage'' then dividing such sum by two; and (iv) the ''Monthly Average NBBO Quoting Percentage'' for each security by summing the security's ''Average Daily NBBO Quoting Percentages'' for each trading day in a calendar month then dividing the resulting sum by the total number of trading days in such calendar month.[39] [40]

Proposed paragraph (f)(2)(C) provides that a LEAD MM's Qualified Executions in each of its LEAD MM Securities must comprise on an equally-weighted daily average at least 2% of all Qualified Executions in the same security over the course of a calendar month.[41] The Exchange believes that the 2% requirement is sufficiently high to require a material contribution to overall volume in the security, while not rendering the requirement impractical in the event the security is assigned numerous LEAD MMs.

Proposed paragraph (f)(2)(D) provides that at least 80% of the LEAD MM's Qualified Executions in each of its LEAD MM Securities must result from its resting orders that originated from the corresponding LEAD MM Trading Account over the course of a calendar month.[42]

The Exchange submits that the proposed Minimum Performance Standards are commensurate with the benefit afforded to LEAD MMs. Given that the only benefit afforded to LEAD MMs is the ability to cancel and cancel/replace its resting orders without delay, the Exchange believes that it would be inappropriate to adopt even higher quoting and trading requirements, such as those for Designated Marker Makers (''DMMs'') on the New York Stock Exchange (''NYSE''), who, in return for such higher quoting and trading requirements, receive certain financial and execution parity benefits not proposed herein.[43]

Proposed paragraph (f)(3) provides rules regarding the process by which Market Makers would be assigned securities as a LEAD MM. Specifically, proposed paragraph (f)(3)(A) provides that only a Market Maker may apply to be assigned one or more securities as a LEAD MM. Market Makers must receive written approval from the Exchange to be assigned securities as a LEAD MM. LEAD MMs shall be selected by the Exchange based on factors including, but not limited to, experience with making markets in securities, adequacy of capital, willingness to promote the Exchange as a marketplace, issuer preference, operational capacity, support personnel and history of adherence to Exchange rules and securities laws. Current Article 16, Rules 2(c)–(e) regarding withdrawal from assigned securities shall also apply to LEAD MMs and LEAD MM Securities.[44]

Proposed paragraph (f)(3)(B) outlines requirements regarding LEAD MM Trading Accounts and provides that before beginning LEAD market making activities in a security, a LEAD MM shall complete the following, subject to Exchange approval. Thereunder, proposed subparagraph (B)(i) provides that the LEAD MM must establish at least one separately designated LEAD MM Trading Account through which all and only LEAD market making activities in LEAD MM Securities shall originate.

Subparagraph (B)(ii) provides that the LEAD MM must register each of its LEAD MM Securities to precisely one LEAD MM Trading Account (''Valid LEAD MM Trading Account''); provided, however, that a LEAD MM Trading Account may be registered with one or more LEAD MM Securities. All messages related to a single LEAD MM Security must originate from the Valid LEAD MM Trading Account on a given day and in the event a LEAD MM wishes to change the Valid LEAD MM Trading Account for a given LEAD MM Security, the LEAD MM shall so notify the Exchange in writing by no later than 9 a.m. on the trading day immediately preceding the effective date of the change; provided, however, that the Exchange may, at its discretion, delay or deny the change. In addition, no change of a Valid LEAD MM Trading Account for a given LEAD MM Security may be effected intraday.

Proposed paragraph (f)(3)(B) facilitates the ability of the Exchange to monitor compliance with the proposed Minimum Performance Standards by requiring a LEAD MM to submit all LEAD market making activities in a particular security through a Valid LEAD MM Trading Account. Moreover, in the event a LEAD MM would like to change the Valid LEAD MM Trading Account for a given LEAD MM Security, the proposed rule outlines the precise procedures to effect the change, which promotes clarity regarding the process.

Proposed paragraph (f)(3)(C) provides that the Exchange may, at its discretion, approve more than one LEAD MM to be assigned to any LEAD MM Security and limit the number of LEAD MMs assigned to any security.

Proposed paragraph (f)(3)(D) provides that the Exchange will review each LEAD MM's quoting and trading activity on a monthly basis to determine whether the LEAD MM has met the Minimum Performance Standards. Also, a LEAD MM's failure to meet the Minimum Performance Standards on any given month will result in the Exchange (i) suspending or terminating a LEAD MM's registration as a Market Maker pursuant to current Article 16, Rule 1(d) or (ii) suspending or terminating assignment to a LEAD MM Security pursuant to proposed subparagraph (A) above. In addition, nothing in proposed subparagraph (D) will limit any other power of the Exchange to discipline a LEAD MM pursuant to CHX Rules.

[37] *See* CHX Article 1, Rule 2(f)(3) defining ''Round Lot.''

[38] *See* CHX Article 1, Rule 1(qq) defining ''Open Trading State.''

[39] For example, a LEAD MM with a Monthly Average NBBO Quoting Percentage of 11% would meet the requirements of proposed paragraph (f)(2)(B), even if on a particular day during the calendar month, the LEAD MM's Average Daily Quoting Percentage was 9%.

[40] *See supra* note 35.

[41] For example, a LEAD MM whose Qualified Executions in an assigned security comprised on average 3% of all Qualified Executions in the assigned security over the course of a calendar month would meet the requirements of proposed paragraph (f)(2)(C), even if on a particular day during the calendar month, the LEAD MM's Qualified Executions in the same assigned security comprised 1% of all Qualified Executions in the assigned security on that day.

[42] Unlike the standards provided under proposed paragraphs (f)(2)(A)–(C), this standard would be measured based on aggregate activity over the course of a calendar month.

[43] *See generally* NYSE Rules 103B and 104.

[44] The Exchange will expand its current procedures for voluntary and involuntary withdrawals regarding Marker Maker securities to apply to LEAD MM Securities.

Amended Article 20, Rule 8 (Operation of the CHX Matching System)

Proposed Article 20, Rule 8(h) provides rules regarding the operation of LEAD. Specifically, proposed paragraph (h) begins by stating that after initial receipt [45] of a new incoming message, the Matching System will evaluate [46] the message to determine whether it is a Delayable Message, as defined under proposed paragraph (h)(1) below. For the purposes of such an evaluation only, the Matching System shall not consider Match Trade Prevention (''MTP''), as described under current Article 1, Rule 2(b)(3)(F).[47] If not delayable, the Matching System will immediately process the message without delay.

Proposed paragraph (h)(1) provides that ''Delayable Message'' means all new incoming order, cancel and cancel/replace messages, except as follows:

(A) Any new incoming order or unrouted balance, as described under proposed subparagraph (D) below, that originates from a Valid LEAD MM Trading Account, as described under proposed Article 16, Rule 4(f)(3)(B)(ii), that would, by its terms, immediately be ranked on CHX book without executing against any existing resting orders on the CHX book shall not be a Delayable Message.

(B) A cancel message related to a resting order that originates from a Valid LEAD MM Trading Account shall not be a Delayable Message.

(C) A cancel/replace message related to a resting order that originates from a Valid LEAD MM Trading Account shall not be a Delayable Message; provided, however, that if any part of the replace portion would immediately execute against existing resting orders on the CHX book, the replace portion shall be a Delayable Message.

(D) The portion of a new incoming Routable Order that is to be routed away, pursuant to current Article 19, Rule 3(a), shall not be diverted into the LEAD; provided, however, that the entire unrouted balance of the Routable Order shall be diverted into the LEAD, subject to proposed subparagraph (A).

Mechanically, upon initial receipt of a new incoming message, the Matching System would assign the message a unique sequence number, as it does currently, which, in addition to establishing processing and execution priority, will serve as the starting point for the Fixed LEAD Period, as described below. The Matching System would then initially evaluate the message to determine whether it is a Delayable Message.[48] For example, a new incoming limit order marked Post Only [49] that originated from a Valid LEAD MM Trading Account that would not be immediately ranked on the CHX book due to one or more matchable contra-side orders resting on the CHX book would be a Delayable Message because the Post Only order would not, by its terms, immediately be ranked on the CHX book without executing against any resting orders on the CHX book. In such a case, the Post Only order would be diverted into the LEAD queue before being processed by the Matching System, which would result in the Post Only order being posted or cancelled depending on the state of the CHX book upon its release.[50] If, however, the Exchange were to receive a new Post Only order that originated from a Valid LEAD MM Trading Account that would post to the CHX book due to no existing orders resting on the CHX book at that time, the Post Only order would not be a Delayable Message and it would immediately be ranked on the CHX book without delay.[51] Similarly, a new incoming order marked CHX Only [52] that originated from a Valid LEAD MM Trading Account that would trade-through a protected quotation of an external market would not be a Delayable Message as it would be price slid to a permissible price.[53] Also, a new incoming order that originated from a Valid LEAD MM Trading Account that would immediately be ranked on the CHX book without executing against any resting orders because MTP would cancel the resting contra-side orders against which the order would have executed, would be a Delayable Message, as MTP is ignored for the purposes of the LEAD evaluation only.[54]

Proposed paragraph (h) continues by providing that if a message is delayable, the message will be diverted into the LEAD queue and will remain delayed until it is released for processing. A delayed message shall become releasable 350 microseconds after initial receipt by the Exchange (''Fixed LEAD Period''),[55] but shall only be processed after the Matching System has evaluated and processed, if applicable,[56] all messages in the security received by the Exchange during the Fixed LEAD Period for the delayed message. A message may be delayed for longer than the Fixed LEAD Period depending on the then-current messaging volume at CHX.[57] The Matching System will utilize a new market snapshot to process a released order.[58] A delayed message shall retain its original sequence number and may only be delayed once. LEAD shall apply to all securities traded on the Exchange throughout the trading day.[59] LEAD shall not apply to messages received during an auction.[60]

The Exchange also proposes to make corresponding amendments to current Article 20, Rule 8(d) and (f) to contemplate LEAD. Specifically, the Exchange proposes to add the clause ''subject to paragraph (h) below'' at the end of current paragraph (d)(1) so that amended paragraph (d)(1) provides as follows:

[45] As used herein, ''initial receipt'' means the time at which the Exchange receives a message and assigns the message a unique sequence number, which the Exchange utilizes to determine, among other things, message processing order and ranking on the CHX book. *See* CHX Article 20, Rule 8(b).

[46] *See supra* note 21.

[47] The purpose of ignoring MTP in LEAD evaluation is to provide a previously delayed order that would not have triggered MTP an opportunity to execute against the resting order before the newer incoming order would cancel the resting order after release from LEAD. The Exchange is also proposing unrelated modifications to MTP to contemplate LEAD, as discussed below.

[48] The Exchange notes that the Matching System processes messages for a given security serially. Thus, the length of time it takes for a message to be evaluated and/or processed by the Matching System after initial receipt is herein called ''variable message queuing delay,'' as the actual length of the delay depends on the number of precedent messages that have yet to be evaluated and/or processed by the Matching System and are residing in the ''Inbound Queue.'' The length of time it takes for a message to be evaluated and/or processed by the Matching System is herein called ''system processing delay.''

[49] *See* CHX Article 1, Rule 2(b)(1)(D) defining ''Post Only.''

[50] *See infra* Example 2.

[51] *See id.*

[52] *See* CHX Article 1, Rule 2(b)(1)(C) defining ''CHX Only.''

[53] *See* CHX Article 20, Rule 5(a)(2).

[54] *See supra* note 47.

[55] In the event that then-current messaging volume results in a Delayable Message being evaluated after 350 microseconds from initial receipt, the Delayable Message shall be diverted into LEAD and be immediately releasable. This will ensure that messages received during the Fixed LEAD Period for a delayed message are evaluated and processed, if applicable, before the Delayable Message is released.

[56] For example, an order that would not take liquidity from the CHX book would not be delayed and would be immediately processed, whereas an order that would take liquidity from the CHX book would be delayed and would not be immediately processed.

[57] In the event a releasable message is awaiting other messages received during its Fixed LEAD Period to be evaluated and processed, if applicable, the releasable message would be subject to an additional unintentional variable delay that is a function of the then-current messaging volume at CHX. *See supra* note 21; *see also supra* note 45; *see also infra* Examples 1–3.

[58] The purpose of a new market snapshot is to ensure that the released order is processed in a manner consistent with federal securities rules and regulations, such as Regulation NMS and Regulation SHO.

[59] *See supra* note 5.

[60] For example, if the Exchange receives an order after initiation of a Sub-second Non-displayed Auction Process (''SNAP'') in the security, the order will not be diverted into the LEAD queue and, rather, be handled pursuant to current CHX Article 18, Rule 1.

Except for certain orders which shall be executed as described in Rule 8(e), below, an incoming order shall be matched against one or more resting orders in the Matching System, in the order in which the resting orders are ranked on the CHX book, pursuant to Rule 8(b) above, at the Working Price of each resting order, as defined under Article 1, Rule 1(pp), for the full amount of shares available at that price, or for the size of the incoming order, if smaller; subject to paragraph (h) below.

The Exchange also proposes to amend paragraph (f)(1) to provide that orders resting on the CHX book shall be immediately and automatically cancelled upon receipt of a cancellation message, subject to paragraph (h) below, as certain cancel messages will be diverted into the LEAD as described above.

Examples 1–2 below illustrate the operation of LEAD.

Amended Routing Protocol

In light of the possible bifurcation of a Routable Order into an immediately routed portion and a delayed unrouted portion [61] and the fact that the Exchange does not currently utilize any Router Feedback to augment protected quotations,[62] LEAD could result in a single order being routed twice to satisfy the same protected quotation. In order to eliminate this inefficiency, the Exchange proposes to amend its current order routing protocol to adopt a single type of Router Feedback utilized by the Bats BYX Exchange,[63] Immediate Feedback, but only on an order-by-order basis. Use of Immediate Feedback would permit the Exchange to augment away quotes on an order-by-order basis to avoid double routing of the same order to satisfy the same protected quotation(s).

Specifically, Immediate Feedback would permit the Exchange to decrease the number of shares available at an away market by an amount equal to the size of the immediately routed portion of the Routable Order. In the extremely unlikely event that the Exchange receives an execution report from an away market indicating that the routed portion of a Routable Order had partially-executed prior to the unrouted balance being released from the LEAD queue, the Exchange would first add the cancelled remainder to the unrouted balance in the LEAD queue and then continue to utilize Immediate Feedback to augment the relevant away quotes when processing the unrouted balance upon release from the LEAD queue, unless the feedback had expired.

Immediate Feedback would expire as soon as: (i) One second passes or (ii) the Exchange receives new quote information from the away market. Given that Immediate Feedback will only be applied on an order-by-order basis, Immediate Feedback would also expire upon full execution, cancellation or ranking of the Routable Order on the CHX book. Also, in light of the relatively short Fixed LEAD Period, it is unlikely that Router Feedback would expire prior to the unrouted balance being released from the LEAD queue and processed by the Matching System.

Examples 2–3 illustrate the operation of the amended routing protocol in the context of LEAD.

Amended Article 1, Rule 2(b)(3)(F) (Match Trade Prevention)

Current Article 1, Rule 2(b)(3)(F) describes the MTP modifier, which prevents matches between orders that originate from the same MTP Trading Group or MTP sublevel thereunder.[64] Also, an order sender must designate one of the following MTP Actions for each order, with the MTP Action noted on the incoming order controlling the MTP interaction:

MTP Cancel Incoming (''N''): An incoming limit or market order marked ''N'' will not execute against opposite side resting interest originating from the same MTP Trading Group or MTP sublevel, if applicable. Only the incoming order will be cancelled pursuant to MTP.

MTP Cancel Resting (''O''): An incoming limit or market order marked ''O'' will not execute against opposite side resting interest originating from the same MTP Trading Group or MTP sublevel, if applicable. Only the resting order will be cancelled pursuant to MTP.

MTP Cancel Both (''B''): An incoming limit or market order marked ''B'' will not execute against opposite side resting interest originating from the same MTP Trading Group or MTP sublevel, if applicable. The entire size of both orders will be cancelled pursuant to MTP.

Given that LEAD may result in newer orders (*i.e.,* orders with lower sequence numbers) becoming resting orders prior to older orders being released from LEAD,[65] the Exchange proposes to amend current Article 1, Rule 2(b)(3)(F)(iii)(a) and (b), which describe MTP Actions ''N'' and ''O'' respectively, to provide that the newer of the contra-side orders, as opposed to the incoming order if it is the older order, would be cancelled if the incoming order is marked ''N,'' and the older of the contra-side orders, as opposed to the resting order if it is the newer order, would be cancelled if the incoming order is marked ''O.'' Moreover, given that a price slid order that triggers MTP is not always the newer order [66] and because the Exchange wishes to maintain the current handling of MTP when it is triggered by a price slid order, the Exchange proposes to add clauses to the end of current subparagraphs (a) and (b) that preserve that current handling. Thus, amended subparagraphs (a) and (b) provide as follows:

(a) *MTP Cancel New* (''*N*''): An incoming limit or market order marked ''N'' will not execute against opposite side resting interest originating from the same MTP Trading Group or MTP sublevel, if applicable. Only the newer order will be cancelled pursuant to MTP; provided that the incoming order will be cancelled, even if it is not the newer order, in the event MTP is triggered by the incoming order being price slid pursuant to the CHX Only Price Sliding Processes.

(b) *MTP Cancel Old (''O''):* An incoming limit or market order marked ''O'' will not execute against opposite side resting interest originating from the same MTP Trading Group or MTP sublevel, if applicable. Only the older order will be cancelled pursuant to MTP; provided that the resting order will be cancelled, even if it is not the older order, in the event MTP is triggered by the incoming order being price slid pursuant to the CHX Only Price Sliding Processes.

Example 4 below illustrates the operation of the amended MTP in the context of LEAD.

(4) *Examples*

The following Examples are illustrative of LEAD and related amendments to existing functionality, but do not exhaustively depict every possible scenario that may arise under LEAD. Moreover, the Examples do not necessarily depict the actual technical processes of prioritizing messages and executing orders.

[61] *See* proposed CHX Article 20, Rule 8(h)(1)(D).

[62] The Exchange does not currently ignore or modify SIP quote data for away markets under any circumstances where the SIP data feed shows an uncrossed market. *See* Exchange Act Release No. 74357 (February 24, 2015), 80 FR 11252 (March 2, 2015) (SR–CHX–2015–01); *see also* Securities Exchange Act Release No. 72711 (July 29, 2014), 79 FR 45570 (August 5, 2014) (SR–CHX–2014–10).

[63] ''Router Feedback'' refers to the use of routed orders (''Feedback Orders'') to augment protected quotations for the purposes of calculating the National Best Bid and Offer. *See* Securities Exchange Act Release No. 74075 (January 15, 2015), 80 FR 3693 (January 23, 2015) (SR–BYX–2015–03).The three types of Router Feedback are Immediate Feedback, Execution Feedback and Cancellation Feedback. *See id.* at 3695.

[64] *See* Securities Exchange Act Release No. 71216 (December 31, 2013), 79 FR 883 (January 7, 2014) (SR–CHX–2013–23); *see also* Securities Exchange Act Release No. 70948 (November 26, 2013), 78 FR 72731 (December 3, 2013) (SR–CHX–2013–20).

[65] Currently, a new incoming order that triggers MTP is always newer than the resting contra-side order. However, LEAD may result in the newer of the contra-side orders being the resting order and the older order being the incoming order. *See infra* Example 4.

[66] *See* Example 4 under SR–CHX–2013–20.

Example 1: LEAD. Assume that LEAD is operational, all messages are for security XYZ and all orders are routable, unless marked otherwise. Assume also that the system processing delay [67] is 50 microseconds [68] and the CHX book is as follows:

Fig 1(a): CHX book

Buy	Sell
Empty	*Order A:* 1000 @10.01 (LMM).[69]

Assume then that the Exchange receives the following messages:

Fig 1(b): Inbound queue

Initial receipt	Message
10:00:00.000000	*Order B:* Buy 1000 @10.01.
10:00:00.000265	*Cancel Order A* (LMM).
10:00:00.000305	*Order C:* Sell 1000 @10.02.
10:00:00.000310	*Order D:* Buy 1000 @10.01 (LMM).
10:00:00.000325	*Cancel Order B.*
10:00:00.000355	*Order E:* Sell 1000 @10.01.

Under this Example 1:

• *Order B* would be evaluated and diverted into LEAD as it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system processing delay, *Order B* would be diverted into LEAD at 10:00:00.000050 and releasable at 10:00:00.000350. The result is that the LEAD queue would be as follows:

Fig 1(c): LEAD queue

Releasable time	Message
10:00:00.000350	*Order B:* Buy 1000 @10.01.

• *Cancel Order A* would be evaluated and processed at 10:00:00.000265 without being diverted into LEAD as it is a cancel message for a resting order that originated from a Valid LEAD MM Trading Account and is thus not a Delayable Message. Due to the system processing delay, *Order A* would be cancelled at 10:00:00.000315 and the CHX book would become empty.

• *Order C* would then be evaluated at 10:00:00.000315, due to the variable message queuing delay,[70] and be diverted into LEAD because it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system processing delay, *Order C* would be diverted into LEAD at 10:00:00.000365 and releasable at 10:00:00.000665.

Fig 1(d): LEAD queue

Releasable time	Message
10:00:00.000350	*Order B:* Buy 1000 @10.01.
10:00:00.000665	*Order C:* Sell 1000 @10.02.

[67] *See supra* note 48.

[68] The Exchange does not represent that actual system processing delay is at or near 50 microseconds or that unintentional delays do not exist elsewhere in the Matching System processes. The figure is being utilized for demonstrative purposes only.

[69] ''LMM'' refers to messages that originated from a Valid Lead MM Trading Account. Absence of ''LMM'' means that the message did not originate from a Valid LEAD MM Trading Account.

[70] *See supra* note 48.

• While *Order C* was being evaluated by the Matching System, *Order B* became releasable from the LEAD queue at 10:00:00.000350. However, given that the Matching System processes messages serially,[71] the Matching System would not consider releasing *Order B* until after *Order C* had been placed into the LEAD queue at 10:00:00.000365, at which point it would be handled as follows:

○ At 10:00:00.000365, the Matching System would compare the releasable time of *Order B* to the initial receipt time of the message at the top of the Inbound Queue: *Order D.* Since *Order D* was received during the Fixed LEAD Period for *Order B, Order D* would be evaluated before releasing *Order B* and processed without being diverted into LEAD as it originated from a Valid LEAD MM Trading Account and would be immediately ranked on the CHX book without executing against resting orders on the CHX book and is thus not a Delayable Message. Due to the system processing delay, *Order D* would be ranked on the CHX book at 10:00:00.000415. The result is that the CHX book would be as follows:

Fig 1(e): CHX book

Buy	Sell
Order D: 1000 @10.01 (LMM).	Empty.

○ At 10:00:00.000415, the Matching System would then compare the releasable time of *Order B* to the initial receipt time of the next message at the top of the Inbound Queue: *Cancel Order B.* Since *Cancel Order B* was received when *Order B* was in the LEAD queue, *Cancel Order B* would be diverted into LEAD as it originated from a non-Valid LMM Trading Account and is thus a Delayable Message. However, due to the system processing delay, *Cancel Order B* would be diverted into LEAD at 10:00:00.000465 and releasable at 10:00:00.000675. The result is that the LEAD queue would be as follows:

Fig 1(f): LEAD queue

Releasable time	Message
10:00:00.000350	*Order B:* Buy 1000 @10.01.
10:00:00.000665	*Order C:* Sell 1000 @10.02.
10:00:00.000675	*Cancel Order B.*

○ At 10:00:00.000465, the Matching System would then compare the releasable time of *Order B* to the initial receipt time of the next message at the top of the Inbound Queue: *Order E.* Given that *Order E* was received after the Fixed LEAD Period for *Order B* had expired, the Matching System would release *Order B* before evaluating *Order E.* Due to the system processing delay, *Order B* would be ranked on the CHX book at 10:00:00.000515. Also, given that *Order B* was initially received before *Order D, Order B* would receive execution priority over *Order D,* pursuant to Article 20, Rule 8(b)(1). The result is that the CHX book and LEAD queue would be as follows:

[71] *See id.*

Fig 1(g): CHX book

Buy	Sell
Order B: 1000 @10.01. *Order D:* 1000 @10.01 (LMM).	Empty.

Fig 1(h): LEAD queue

Releasable time	Message
10:00:00.000665	*Order C:* Sell 1000 @10.02.
10:00:00.000675	*Cancel Order B.*

• *Order E* would then be evaluated at 10:00:00.000515, due to the variable message queuing delay, and then diverted into the LEAD as it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system-processing delay, *Order E* would be diverted at 10:00:00.000565 and releasable at 10:00:00.000705. The result is that the LEAD queue would be as follows:

Fig 1(i): LEAD queue

Releasable time	Message
10:00:00.000665	*Order C:* Sell 1000 @10.02.
10:00:00.000675	*Cancel Order B.*
10:00:00.000705	*Order E:* Sell 1000 @10.01.

• *Order C* would then be released from LEAD at 10:00:00.000665. Due to the system processing delay, *Order C* would be ranked on the CHX book at 10:00:00.000715. The result is that the CHX book and LEAD queue are as follows:

Fig 1(j): CHX book

Buy	Sell
Order B: 1000 @10.01. *Order D:* 1000 @10.01 (LMM).	*Order C:* 1000 @10.02.

Fig 1(k): LEAD queue

Releasable time	Message
10:00:00.000675	*Cancel Order B.*
10:00:00.000705	*Order E:* Sell 1000 @10.01.

• *Cancel Order B* would then be released from LEAD at 10:00:00.000715, as the Matching System was processing *Order C* when *Cancel Order B* became releasable at 10:00:00.000675. Due to the system processing delay *Order B* would be cancelled at 10:00:00.000765. The result is that the CHX book and the LEAD queue would be as follows:

Fig 1(l): CHX book

Buy	Sell
Order D: 1000 @10.01 (LMM).	*Order C:* 1000 @10.02.

Fig 1(m): LEAD queue

Releasable time	Message
10:00:00.000705	*Order E:* Sell 1000 @10.01.

• *Order E* would then be released from LEAD at 10:00:00.000765, as the Matching System was processing *Order C* (then *Cancel Order B*) when *Order E* became releasable at 10:00:00.000705. *Order E* would then be processed and fully execute against *Order D* at 10.01/share at 10:00:00.000775, due to the system processing delay. The result is that the Inbound Queue and the LEAD queue would be empty and the CHX book would be as follows:

Empty	*Order C:* 1000 @10.02.

Example 2: Post Only and Routing—Immediate Feedback. Assume the same as Example 1. Assume also that after *Order E* was processed, the NBBO became 10.01 x 10.02 with only one market (''Away Market A_1'') displaying 100 shares at the NBB (''Protected Bid A_1'') and no other protected bids and CHX is alone at the NBO displaying 1000 shares at 10.02. Assume then that the Matching System receives the following new messages in security XYZ:

Fig 2(a): Inbound queue

Initial receipt	Message
10:00:00.000900	*Cancel Order C.*
10:00:00.001000	*Order F:* Post Only Buy 100 @10.02.
10:00:00.001010	*Order G:* Post Only Buy 100 @10.01 (LMM).
10:00:00.001020	*Order H:* Sell 500 @9.99 (LMM).
10:00:00.001030	*Order I:* Sell 500 @9.99.
10:00:00.001600	*Order J:* Buy 600 @9.99.
10:00:00.001610	*Order K:* Sell 200 @9.99 (LMM).
10:00:00.001750	*Cancel Order I.*
10:00:00.001760	*Cancel Order H* (LMM).

Under this Example 2:

• *Cancel Order C* would be evaluated at 10:00:00.000900 and diverted into the LEAD as it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system processing delay, *Cancel Order C* would be diverted at 10:00:00.000950 and releasable at 10:00:00.001250. The result is that the CHX Book and LEAD queue would be as follows:

Fig 2(b): CHX book

Buy	Sell
Empty	*Order C:* 1000 @10.02.

Fig 2(c): LEAD queue

Releasable time	Message
10:00:00.001250	*Cancel Order C.*

• *Order F* would then be evaluated at 10:00:00.001000 and diverted into the LEAD as it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system processing delay, *Order F* would be diverted at 10:00:00.001050 and releasable at 10:00:001350. The result is that the LEAD queue would be as follows:

Fig 2(d): LEAD queue

Releasable time	Message
10:00:00.001250	*Cancel Order C.*
10:00:00.001350	*Order F.*

• *Order G* would then be evaluated at 10:00:00.001050, due to variable message queuing delay, and would be immediately processed without being diverted into LEAD as it originated from a Valid LEAD MM Trading Account and would be immediately ranked on the CHX book without executing against resting orders and is thus not a Delayable Message. Due to the system processing delay, *Order G* would be ranked on the CHX book at 10:00:00.1100. The result is that the CHX book is as follows:

Fig 2(e): CHX book

Buy	Sell
Order G: 100 @10.01 (LMM).	*Order C:* 1000 @10.02.

• *Order H* would then be evaluated at 10:00:00.001100, due to variable message queuing delay. Pursuant to the Exchange's routing protocol, the Exchange would immediately route 100 shares of *Order H* priced at 10.01/share to satisfy Protected Bid A_1, and divert the unrouted 400 shares of *Order H* into the LEAD queue as it is priced such that it would immediately execute against *Order G* and is thus a Delayable Message. Due to the system processing delay, *Order H* would be diverted at 10:00:00.001150, and releasable at 10:00:00.001370. The result is that the LEAD queue would be as follows:

Fig 2(f): LEAD queue

Releasable time	Message
10:00:00.001250	*Cancel Order C.*
10:00:00.001350	*Order F.*
10:00:00.001370	*Order H*—Unrouted Balance (LMM).

• *Order I* would then be evaluated at 10:00:00.001150, due to variable message queuing delay. Given that the proposed Router Feedback is only applied on an order-by-order basis, *Order I* would be handled similarly to *Order H.* Thus, the Exchange would immediately route 100 shares of *Order I* priced at 10.01/share to satisfy Protected Bid A_1, and divert the unrouted 400 shares of *Order I* into the LEAD queue as it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system processing delay, *Order I* would be diverted at 10:00:00.001200 and releasable at 10:00:00.001380. The result is that the LEAD queue would be as follows:

Fig 2(g): LEAD queue

Releasable time	Message
10:00:00.001250	*Cancel Order C.*
10:00:00.001350	*Order F.*
10:00:00.001370	*Order H*—Unrouted Balance (LMM).
10:00:00.001380	*Order I*—Unrouted Balance.

• At 10:00:00.001250, *Cancel Order C* would be released from the LEAD queue. Due to the system processing delay, *Order C* would be cancelled at 10:00:00.01300. The result is that the CHX book and LEAD queue would be as follows:

Fig 2(h): CHX book

Buy	Sell
Order G: 100 @10.01	Empty.

Fig 2(i): LEAD queue

Releasable time	Message
10:00:00.001350	*Order F.*
10:00:00.001370	*Order H*—Unrouted Balance (LMM).
10:00:00.001380	*Order I*—Unrouted Balance.

• At 10:00:00.01350, *Order F* would be released from the LEAD queue. Due to the system processing delay, *Order F* would be ranked on the CHX book at 10:00:00.001400. The result is that the CHX book and the LEAD queue would be as follows:

Fig 2(j): CHX book

Buy	Sell
Order F: 100 @10.02 *Order G:* 100 @10.01.	Empty.

Fig 2(k): LEAD queue

Releasable time	Message
10:00:00.001370	*Order H*—Unrouted Balance (LMM).
10:00:00.001380	*Order I*—Unrouted Balance.

• Due to system processing delays, *Order H* and *Order I* would be released after their respective releasable times as follows:

○ The unrouted balance of *Order H* would be released from the LEAD queue at 10:00:00.001400. *Order H* would then execute against all 100 shares of *Order F* at 10.02/share, as well as all 100 shares of *Order G* at 10.01/share, and the remaining 200 shares of *Order H* would be ranked on the CHX book at 9.99. Due to the system processing delay, the unexecuted balance would be ranked to the CHX book at 10:00:00.001450.

○ The unrouted balance of *Order I* would then be released from the LEAD queue at 10:00:00.001450. All 400 shares of *Order I* would then be ranked on the CHX book at 9.99. Due to the system processing delay, *Order I* would be ranked on the CHX book at 10:00:00.001500. The result is that the LEAD queue would be empty and the CHX book would be as follows:

Fig 2(l): CHX book

Buy	Sell
Empty	*Order H:* 200 @9.99 (LMM). *Order I:* 400 @9.99.

• *Order J* would be evaluated at 10:00:00.001600 and diverted into LEAD as it originated from a non-Valid LEAD MM Trading Account and is thus a Delayable

Message. Due to the system processing delay, *Order J* would be diverted at 10:00:00.001650 and releasable at 10:00:00.001950. The result is that the LEAD queue would be as follows:

Fig 2(m): LEAD queue	
Releasable time	Message
10:00:00.001950	*Order J.*

• *Order K* would be evaluated at 10:00:00.001650, due to the variable messaging delay. *Order K* would be immediately ranked on the CHX book as it originated from a Valid LEAD MM Trading Account and would not immediately execute against any resting orders. Due to the system processing delay, *Order K* would be ranked on the CHX book at 10:00:00.001700. The result is that the CHX book would be as follows:

Fig 2(n): CHX book	
Buy	Sell
Empty	*Order H:* 200 @9.99 (LMM). *Order I:* 400 @9.99. *Order K:* 200 @9.99 (LMM).

• *Cancel Order I* would be evaluated at 10:00:00.001750 and diverted into the LEAD as it is originated from a non-Valid LEAD MM Trading Account and is thus a Delayable Message. Due to the system processing delay, *Cancel Order I* would be diverted at 10:00:00.001800 and releasable at 10:00:00.002100. The result is that the LEAD queue would be as follows:

Fig 2(o): LEAD queue	
Releasable time	Message
10:00:00.001950 ..... 10:00:00.002100	*Order J.* *Cancel Order I.*

• *Cancel Order H* would be evaluated and processed at 10:00:00.001800, due to variable messaging delay, without being diverted into LEAD as it is a cancel message for a resting order that originated from a Valid LEAD MM Trading Account and is thus not a Delayable Message. Due to the system processing delay, *Order H* would be cancelled at 10:00:00.001850. The result is that the CHX Book would be as follows:

Fig 2(p): CHX book	
Buy	Sell
Empty	*Order I:* 400 @9.99. *Order K:* 200 @9.99 (LMM).

• At 10:00:00.001950, *Order J* would be released from the LEAD queue and would immediately execute against all 400 shares of *Order I* at 9.99/share and all 200 shares of *Order K* at 9.99/share. The result is that the CHX book is empty and the LEAD queue is as follows:

Fig 2(q): LEAD queue	
Releasable time	Message
10:00:00.002100	*Cancel Order I.*

• At 10:00:00.002100, *Cancel Order I* would be released from the LEAD queue. Since *Order I* had already been executed in full, *Cancel Order I* will have no effect.

Example 3: Routing—Expired Feedback. Assume the same as Example 2, except that immediately prior to the unrouted balance of Order H being released, the Exchange received an updated quote from Away Market A_1 displaying 1,000 shares at the $10.01.

Under this Example 3, the Immediate Feedback derived from the immediately routed portion of *Order H* would expire and, upon release of the unrouted delayed portion of *Order H,* the Matching System would route the entire unrouted portion to satisfy the updated Protected Bid displayed by Away Market A_1.

Similarly, the Immediate Feedback derived from the immediately routed portion of *Order I* would also expire and, upon release of the unrouted delayed portion of *Order I,* the Matching System would route the entire unrouted portion to satisfy the updated Protected Bid displayed by Away Market A_1.

Example 4: MTP. Assume the same as Example 2, except that *Order J* and *Order K* originated from the same MTP Trading Group and *Order J* has an MTP Action of ''N.''

Under this Example 4, pursuant to the current MTP rules, MTP would be triggered and the *Order J* would be cancelled, as the current ''N'' MTP Action requires the *incoming* order to be cancelled. However, pursuant to the proposed amended MTP rules, *Order K* would be cancelled, as the amended ''N'' MTP action requires the *newer* order to be cancelled, absent a price sliding event.

(5) Operative Date

In the event the proposed rule change is approved by the SEC, the proposed rule change shall be operative pursuant to notice by the Exchange to its Participants. Prior to the operative date, the Exchange will ensure that policies and procedures are in place to allow Exchange operations personnel to effectively monitor the operation of LEAD and compliance by LEAD MMs with the proposed Minimum Performance Standards.

Appendix A: CHX ETF Analysis

The purpose of the CHX ETF Analysis is to demonstrate that latency arbitrage activity [72] in SPY at CHX (''SPY latency arbitrage activity'') has (1) reduced volume and displayed liquidity in SPY at CHX and (2) impaired liquidity provision in SPY marketwide. For the purpose of this CHX ETF Analysis, the following terms shall have the following meanings: [73]

• *After Period* refers to February 2016 through July 2016.

• *Analysis Period* refers to August 2015 through July 2016.

• *Before Period* refers to August 2015 through December 2015.

• *Control Average* refers to the arithmetic average of a given metric for Control Securities.

• *Control Securities* refers to DIA, IWM, and QQQ.[74]

• *Entry Event* refers to a trading day in January 2016 on which latency arbitrage activity in SPY at CHX was first observed.

• *Entry Month* refers to January 2016, the month in which latency arbitrage activity in SPY at CHX was first observed.

• *Subject Securities* refers to SPY and the Control Securities.

Entry of SPY Latency Arbitrage Activity

During the After Period, the Exchange observed unusual messaging patterns in SPY whereby executions of large inbound IOC [75] orders against resting orders in SPY were frequently followed by the receipt of late cancel messages for the executed resting orders very soon after the execution. This observation was corroborated by feedback from liquidity providing Participants that indicated that, unlike prior to the Entry Event, they were no longer able to reliably cancel or cancel/adjust resting orders on the CHX book in SPY in response to market changes after the Entry Event. The Exchange believes that each instance of the unusual messaging pattern is the end result of a race triggered by an away market event (*e.g.,* change in market data from a futures market) whereby the liquidity taker is able to take a resting order at a stale price before the liquidity provider could adjust the resting order to accurately reflect the market. As such, the SPY latency arbitrage activity has had the following impact on volume and liquidity in SPY at CHX and away exchanges:

Analysis 1: SPY Latency Arbitrage Activity Reduced CHX Market Share in SPY Relative to Total Volume in SPY and Disproportionately To Control Securities

As shown under *Figure 1,* CHX Market Share in SPY as a percentage of Total Volume dropped by 90.1% from 5.73% in the Entry Month to 0.57% in

[72] *See supra* note 6; *see also supra* Section 3(a)(2).

[73] Other capitalized terms utilized in the CHX ETF Analysis shall have the meanings set forth under Appendix B.

[74] Each of the Control Securities were selected for the following similarities to SPY in that each is: (1) Highly correlated in price movements with a well-known equity market index; (2) ETFs; (3) traded in CHX's Chicago data center; (4) actively traded in the NMS; and (5) highly correlated with a futures contract traded electronically on the Globex trading platform.

[75] *See* CHX Article 1, Rule 2(d)(4).

July 2016, while CHX Market Share in the Control Average dropped by 45.20% from 5.54% in the Entry Month to 3.03% in July 2016.[76] As shown under *Figure 2,* changes in the average Total Volume during the Analysis Period for the Subject Securities were highly correlated. Thus, *Figure 1* and *Figure 2* show that despite the high correlation between SPY and each of the Control Securities during the Analysis Period, the CHX Market Share in SPY decreased disproportionately to Total Volume, which the Exchange submits is attributed to the SPY latency arbitrage activity.

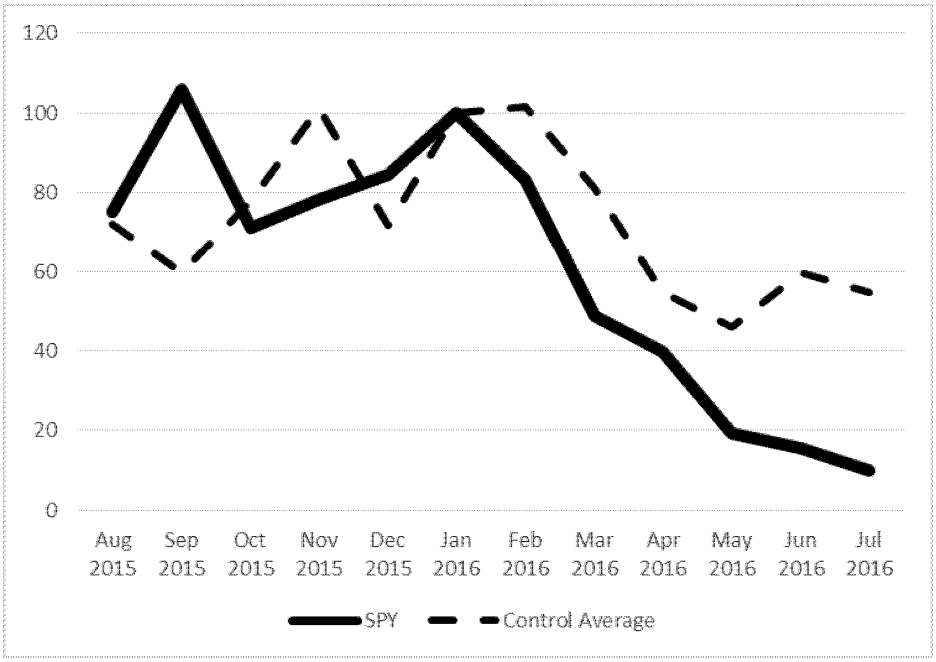

Figure 1. This figure illustrates the decrease in CHX Market Share as a percentage of Total Volume in the Subject Securities (Index: January 2016=100).[77]

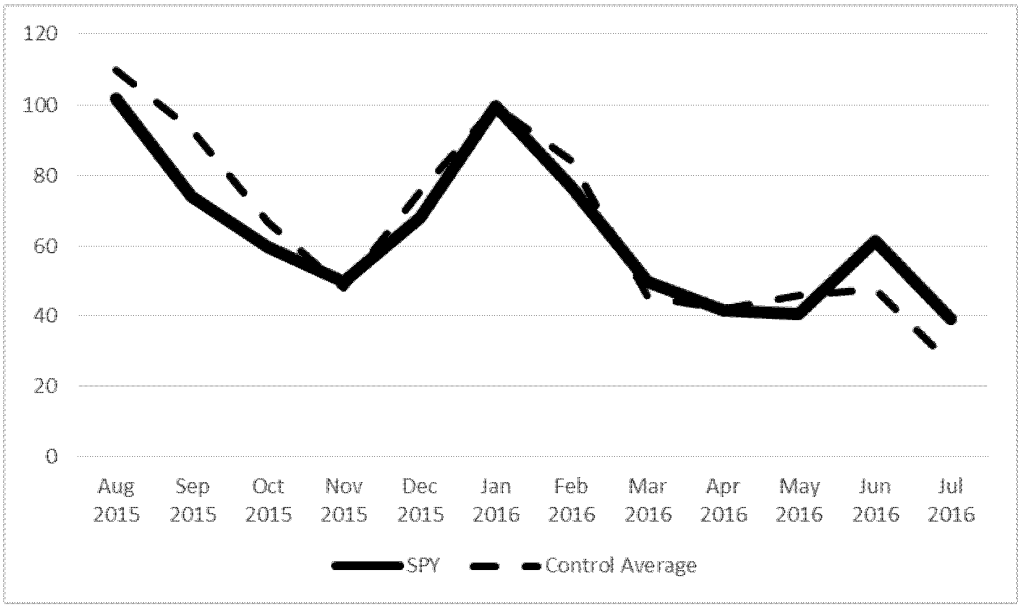

Figure 2. This figure illustrates the correlation in the Total Volume between SPY and the Control Average (Index: January 2016 = 100) during the Analysis Period.[78] [79]

[76] *See infra* Appendix B Calculation Set 1a.

Analysis 2: SPY Latency Arbitrage Activity Resulted in Less Aggressively Priced and Smaller Orders in SPY at CHX

While the Exchange did not observe any discernable change on the NBBO spread in SPY during the After Period, the Exchange did observe a negative impact on the frequency at which CHX was at the NBBO in SPY and the frequency at which CHX displayed the largest quote at the NBBO in SPY during the After Period, while Control Securities experienced either smaller declines or no declines at all.[80]

Specifically, the % of Time CHX Was At The NBB decreased from 23.8% in the Entry Month to 8.2% in July 2016;[81] the % of Time CHX Was At The NBO decreased from 23.3% in the Entry Month to 5.8% in July 2016;[82] and the % of Time CHX Was At The NBB and that CHX Was At The NBO decreased from 3.3% in the Entry Month to 0% in July 2016.[83]

Moreover, the % of Time CHX Was At The NBB And Was The Largest Bid At That Price decreased from 20% in the Entry Month to 2.3% in July 2016;[84] the % of Time CHX Was At The NBO And Was The Largest Offer At That Price decreased from 20.7% in the Entry Month to 1.1% in July 2016;[85] and the % of Time CHX Was At The NBB And Was The Largest Bid At That Price and that CHX Was At The NBO And Was The Largest Offer At That Price decreased from 1.9% to 0%.[86]

These calculation sets clearly show that SPY latency arbitrage activity resulted in less aggressively priced CHX displayed liquidity in SPY and smaller CHX displayed size at the NBBO, during the After Period. SPY latency arbitrage activity also negatively impacted the percentage of the time that CHX was at the NBBO and the percentage of the time CHX displayed the largest quote at the NBBO.

Analysis 3: Latency Arbitrage Activity at CHX Reduced CHX Size At The NBBO in SPY Relative to the Control Securities and NMS Size At The NBBO

As shown under *Figure 3,* during the Before Period, the Time-weighted Average CHX Size at The NBBO for SPY tended to follow changes to the Control Average, whereas from the Entry Month through July 2016, the Time-weighted Average CHX Size At The NBBO for SPY decreased by 82.16% and the Time-weighted Average CHX Size At The NBBO for the Control Average increased by 64.38%.[87] As shown under *Figure 4,* during the Before Period, the monthly changes in the Time-weighted Average CHX Size At The NBBO tended to follow similar changes to the Time-weighted Average NMS Size At The NBBO. However, during the After Period, the monthly changes in the Time-weighted Average CHX Size At The NBBO in SPY did not follow changes to the Time-weighted Average NMS Size At The NBBO in SPY. Moreover, during the After Period, CHX went from having a Two-Sided Market in SPY 100% of regular trading hours in the Entry Month to 74% of regular trading hours in July 2016.[88]

Thus, *Figure 3* and *Figure 4* show that SPY latency arbitrage activity negatively impacted liquidity in SPY marketwide. Moreover, the data shows that the change in the risk/reward of providing liquidity in SPY at CHX which resulted from the introduction of the SPY latency arbitrage activity resulted in a significant reduction of liquidity in SPY provided by CHX, even during a period when significant incremental liquidity was being added in the Control Securities.

[77] *See infra* Appendix B Calculation Sets 1a and 1b.

[78] The correlation coefficients (ρ) over the twelve-month period were: ρ(SPY, DIA) = 0.9118, ρ(SPY, IWM) = 0.8996, ρ(SPY, QQQ) = 0.9392, ρ(SPY, Average) = 0.9493.

[79] *See infra* Appendix B Calculation Sets 2a and 2b.

[80] *See infra* Appendix B Calculation Sets 6 and 7.

[81] *See infra* Appendix B Calculation Set 6a.

[82] *See infra* Appendix B Calculation Set 6b.

[83] *See infra* Appendix B Calculation Set 6c.

[84] *See infra* Appendix B Calculation Set 7a.

[85] *See infra* Appendix B Calculation Set 7b.

[86] *See infra* Appendix B Calculation Set 7c.

[87] *See infra* Appendix B Calculation Sets 3a and 3b.

[88] *See infra* Appendix B Calculation Set 5.

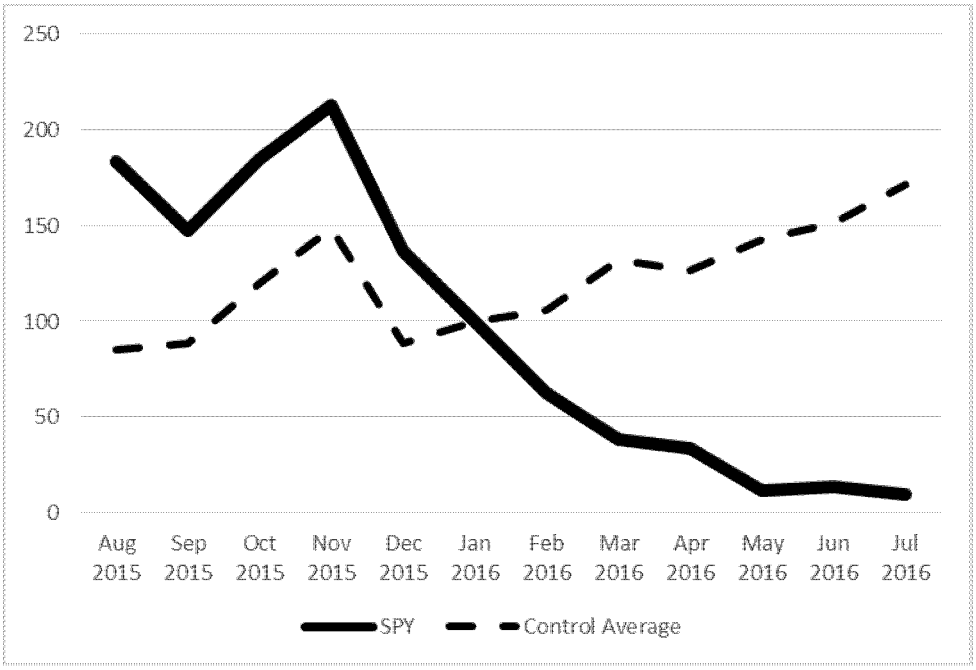

Figure 3. This figure illustrates the Time-weighted Average CHX Size At The NBBO in the Subject Securities (Indexed: January 2016 = 100) during the Analysis Period.[89]

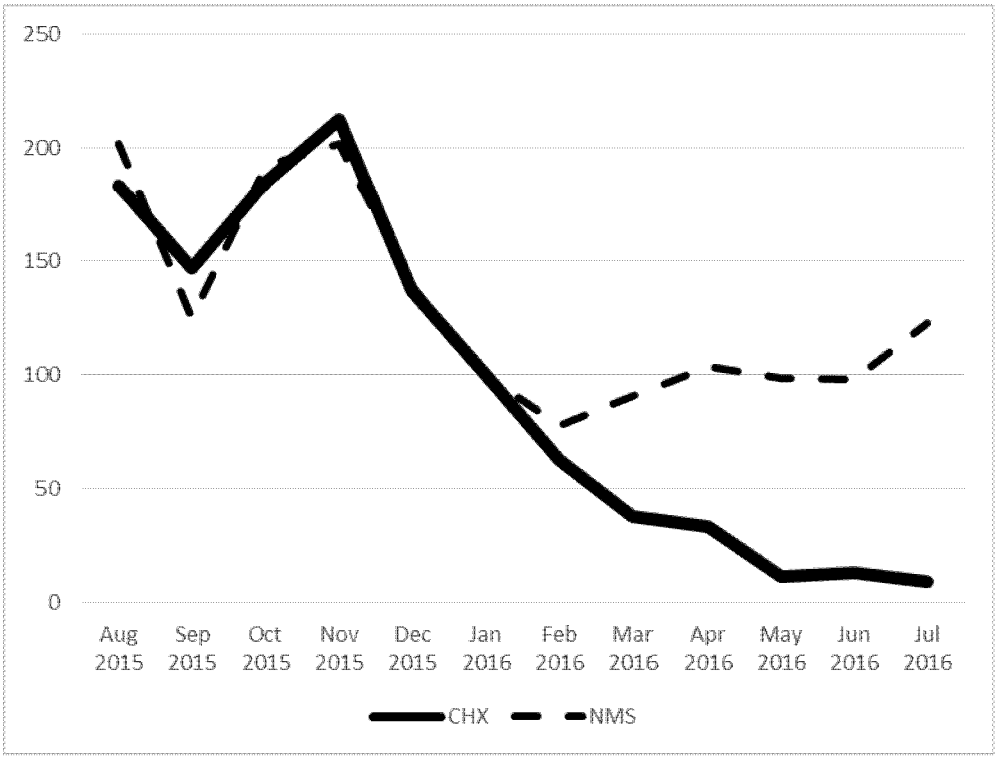

Figure 4. This figure illustrates the Time-weighted Average CHX Size At The NBBO in SPY versus Time-weighted Average NMS Size At The NBBO in SPY (Indexed: January 2016 = 100) during the Analysis Period.[90]

Analysis 4: SPY Latency Arbitrage Activity Reduced Displayed Liquidity in SPY Marketwide

Although the Time-weighted Average NMS Size At The NBBO in SPY increased by 22.83% during the After Period, the increase in SPY did not follow much greater increases in the Time-weighted Average NBBO Size in the Control Group, which increased by 128.82% during the After Period.[91] Moreover, during the After Period, the Time-weighted Average CHX Size At The NBBO for SPY decreased by 90.61% [92] and, as a % of total NMS Size At The NBBO in SPY, from 44.36% to 3.39%.[93] These calculations suggest that the SPY latency arbitrage activity materially impacted displayed liquidity in SPY marketwide. The dramatic decrease in displayed liquidity in SPY at CHX during the After Period explains why the increase in Time-weighted Average NBBO Size in SPY lagged behind the increase in Time-weighted Average NBBO Size in the Control Securities. Had CHX Size At The NBBO remained at least constant during the After Period, NBBO Size in SPY would have been at least 32.7% higher in July 2016, as shown below: [94]

	NMS Size at NBBO			Change attribution	
	Jan-16	Jul-16	Change	CHX	Others
SPY	9,513	11,686	2,172	−3,824	5,996
DIA	2,569	4,711	2,142	1,227	915
IWM	5,222	10,026	4,804	536	4,268
QQQ	14,100	35,354	21,253	3,900	17,353
Control Average	7,297	16,697	9,400	1,888	7,512

Conclusion

Based on its observations of unusual messaging patterns in SPY, feedback from Participants and the analysis summarized above, the Exchange believes that the unusual messaging activity in SPY that was first observed in the Entry Month is attributed to SPY latency arbitrage activity. The market data shows that in response to the SPY latency arbitrage activity, CHX liquidity providers displayed smaller orders in SPY at less aggressive prices during the After Period relative to the Before Period and Entry Month. Moreover, in light of CHX's significant contribution to overall volume and liquidity in SPY during the Before Period and the Entry Month, diminished displayed liquidity at CHX has materially impaired displayed liquidity in SPY market wide.

Appendix B: Calculation Sets

The calculations sets below were prepared with microsecond-level trade and quote record. Trade records include the date, microsecond-level timestamp, exchange, security symbol, price, and quantity of all trades reported to the consolidated tape. Quote records include the date, microsecond-level timestamp, exchange, security symbol, bid price, bid quantity, ask price, and ask quantity of all quotes reported to the consolidated tape. Only protected quotations are reported to the consolidated tape.

The Analysis Period for the calculations begins on August 1, 2015 and ends on July 31, 2016. Symbols SPY and three other Control Securities (*i.e.,* DIA, IWM, and QQQ) were considered. Only trades and quotes that occurred on the national securities exchanges during the regular trading hours [95] were considered. Certain types of non-standard trades were excluded.[96] Quotes with negative prices or quantities were excluded. Unless otherwise indicated, lengths of time when the market was locked or crossed were not considered.

In the calculations below:

- *Total Volume* refers to the number of shares of the indicated symbol traded on the national securities exchanges on a given day, excluding certain types of non-standard trades. *CHX Volume* refers to the number of shares of the indicated symbol traded on CHX on a given day, excluding certain types of non-standard trades.
- *CHX Market Share* was calculated as CHX Volume divided by Total Volume on a given day, CHX Market Share = CHX Volume ÷ Total Volume.
- *CHX Had A Two-Sided Market* refers to an indicator variable defined as true at any microsecond when there was at least one bid and at least one offer among all outstanding orders on CHX, and false otherwise. *CHX Had A One-Sided Market* refers to an indicator variable defined as true at any microsecond when there was at least one bid but no offers among all outstanding orders on CHX or when there was at least one offer but no bids among all outstanding orders on CHX, and false otherwise. *CHX Had No Market* refers to an indicator variable defined as true at any microsecond when there were no outstanding orders on CHX, and false otherwise.
- A bid was *At The NBB* at any microsecond when its price was equal to the National Best Bid. An offer was *At The NBO* at any microsecond when its price was equal to the National Best Offer.
- At any microsecond, the *NMS Size At The National Best Bid* (''NMS Size At The NBB'') refers to the quantity of shares in prevailing bids on the national securities exchanges priced at the National Best Bid and the *NMS Size At The National Best Offer* (''NMS Size At The NBO'') refers to the quantity of shares in prevailing offers on the national securities exchanges priced at the National Best Offer. *NMS Size At The NBBO* was calculated as the average of the National Best Bid Size and the National Best Offer Size at each microsecond, NMS Size At The NBBO = (NMS Size At The NBB + NMS Size At The NBO) ÷ 2.
- *CHX Was At The NBB* refers to an indicator variable defined as true at any microsecond when the CHX Best Bid was at the National Best Bid, and false otherwise. *CHX Was At The NBO* refers to an indicator variable defined as true at any microsecond when the CHX Best Offer was at the National Best Offer, and false otherwise.
- At any microsecond, the *CHX Size At The NBB* (''CHX Size At The NBB'') refers to the CHX Best Bid Size if CHX was at the NBB and zero if CHX was not at the NBB. At any microsecond, the *CHX Size At The NBO* (''CHX Size At The NBO'') refers to the CHX Best Offer Size if CHX was at the NBO and zero if CHX was not at the NBO. *CHX Size At The NBBO* was calculated as the average of the CHX Size At The NBB and CHX Size At The NBO at each microsecond, CHX Size At The NBBO = (CHX Size At The NBB + CHX Size At The NBO) ÷ 2.
- *CHX Was At The NBB And Was The Largest Bid At That Price* refers to an indicator variable defined as true at any

[89] *See infra* Appendix B Calculation Sets 3a and 3b.

[90] *See infra* Appendix B Calculation Sets 3b and 4b.

[91] *See infra* Appendix B Calculation Set 4a.

[92] *See infra* Appendix B Calculation Set 3a.

[93] *See infra* Appendix B Calculations Sets 3a and 4a.

[94] *See infra* Appendix B Calculation Set 4a.

[95] *See* 17 CFR 242.600(b)(64).

[96] Non-standard trades include derivatively priced trades, qualified contingent trades, opening trades, closing trades, and after hours trades.

microsecond when CHX was at the National Best Bid and the CHX Best Bid Size was greater than or equal to the largest quantity of shares in prevailing bids on any one national securities exchange other than CHX, and false otherwise. *CHX Was At The NBO And Was The Largest Offer At That Price* refers to an indicator variable defined as true at any microsecond when CHX was at the National Best Offer and the CHX Best Offer Size was greater than or equal to the largest quantity of shares in prevailing offers on any one national securities exchange other than CHX, and false otherwise.

For the calculations in the table below:

• Monthly average values are shown. Monthly average values were calculated as the average of daily values for each day in a month. Daily values were calculated as time-weighted averages or as percentages of time in the trading day, as indicated in the table. *Time-weighted average* values were calculated as daily average of the specified quantity, market share, or spread value weighted by time (in microseconds). *% of time* values were calculated as the length of time (in microseconds) for which the specified indicator variable was true divided by the length of time in that trading day, excluding lengths of time during which the market was locked or crossed or otherwise could not be calculated (*e.g.,* at the start of the trading day).

[No.] Calculation	Month	Symbol				
		SPY	DIA	IWM	QQQ	Control Average
		[1]	[2]	[3]	[4]	([2]:[4])
[1a] CHX market share (% of total volume)	Aug 2015	4.32%	3.07%	5.51%	3.40%	3.99%
	Sep 2015	6.07%	2.61%	3.82%	3.46%	3.30%
	Oct 2015	4.08%	5.95%	2.58%	4.42%	4.32%
	Nov 2015	4.49%	8.58%	3.14%	5.13%	5.62%
	Dec 2015	4.85%	4.89%	2.53%	4.49%	3.97%
	Jan 2016	5.73%	9.13%	3.14%	4.35%	5.54%
	Feb 2016	4.78%	9.13%	3.32%	4.41%	5.62%
	Mar 2016	2.80%	7.54%	2.38%	3.57%	4.50%
	Apr 2016	2.28%	4.41%	2.01%	2.69%	3.04%
	May 2016	1.10%	3.53%	2.21%	1.93%	2.55%
	Jun 2016	0.90%	5.17%	1.74%	3.00%	3.30%
	Jul 2016	0.57%	6.11%	1.22%	1.77%	3.03%
[1b] CHX market share (% of total volume) index: January 2016 = 100.	Aug 2015	75	34	176	78	72
	Sep 2015	106	29	122	80	60
	Oct 2015	71	65	82	102	78
	Nov 2015	78	94	100	118	101
	Dec 2015	85	54	81	103	72
	Jan 2016	100	100	100	100	100
	Feb 2016	83	100	106	102	102
	Mar 2016	49	83	76	82	81
	Apr 2016	40	48	64	62	55
	May 2016	19	39	70	44	46
	Jun 2016	16	57	55	69	60
	Jul 2016	10	67	39	41	55
[2a] Average total volume	Aug 2015	130,150,083	6,153,725	26,846,599	33,963,873	23,568,046
	Sep 2015	94,627,144	6,552,649	21,381,524	28,452,481	19,947,099
	Oct 2015	75,881,581	4,461,519	22,420,310	22,701,556	14,268,977
	Nov 2015	63,307,314	3,673,677	16,624,141	17,531,483	10,308,999
	Dec 2015	87,011,822	4,969,853	23,287,782	24,474,150	16,211,695
	Jan 2016	127,469,871	8,301,912	35,204,822	39,029,308	21,425,674
	Feb 2016	97,911,733	6,121,299	27,668,000	35,547,824	18,060,375
	Mar 2016	63,333,000	2,521,807	20,709,893	17,600,599	9,724,974
	Apr 2016	53,023,531	2,337,084	15,556,074	14,984,599	8,991,216
	May 2016	51,578,634	2,016,095	17,899,288	14,856,962	9,822,504
	Jun 2016	78,385,026	2,740,421	20,938,721	16,963,513	10,240,678
	Jul 2016	49,783,615	2,130,330	14,122,275	11,973,239	5,657,111
[2b] Average total volume index: Jan 2016 = 100.	Aug 2015	102	74	76	87	110
	Sep 2015	74	79	61	73	93
	Oct 2015	60	54	64	58	67
	Nov 2015	50	44	47	45	48
	Dec 2015	68	60	66	63	76
	Jan 2016	100	100	100	100	100
	Feb 2016	77	74	79	91	84
	Mar 2016	50	30	59	45	45
	Apr 2016	42	28	44	38	42
	May 2016	40	24	51	38	46
	Jun 2016	61	33	59	43	48
	Jul 2016	39	26	40	31	26
[3a] Time-weighted average CHX size at the NBBO.	Aug 2015	7,740.13	753.47	2,294.04	3,666.82	2,238.11
	Sep 2015	6,217.48	682.18	2,157.29	4,177.88	2,339.12
	Oct 2015	7,816.38	1,308.53	2,052.68	6,130.87	3,164.03
	Nov 2015	8,983.84	2,439.37	2,158.33	7,182.16	3,926.62
	Dec 2015	5,776.73	1,152.21	1,517.59	4,347.08	2,338.96
	Jan 2016	4,220.05	1,830.97	1,726.35	4,341.83	2,633.05
	Feb 2016	2,642.32	1,829.95	2,004.50	4,523.73	2,786.06

[No.] Calculation	Month	Symbol				
		SPY	DIA	IWM	QQQ	Control Average
		[1]	[2]	[3]	[4]	([2]:[4])
	Mar 2016	1,611.90	2,347.82	2,077.08	5,987.78	3,470.89
	Apr 2016	1,415.95	1,481.35	2,314.10	6,196.84	3,330.76
	May 2016	485.23	1,469.69	2,374.66	7,423.33	3,755.89
	Jun 2016	565.73	1,772.03	2,188.41	7,994.73	3,985.06
	Jul 2016	396.37	3,057.61	2,262.70	8,241.77	4,520.69
[3b] Time-weighted average CHX size at the NBBO index: Jan 2016 = 100.	Aug 2015	183	41	133	84	85
	Sep 2015	147	37	125	96	89
	Oct 2015	185	71	119	141	120
	Nov 2015	213	133	125	165	149
	Dec 2015	137	63	88	100	89
	Jan 2016	100	100	100	100	100
	Feb 2016	63	100	116	104	106
	Mar 2016	38	128	120	138	132
	Apr 2016	34	81	134	143	126
	May 2016	11	80	138	171	143
	Jun 2016	13	97	127	184	151
	Jul 2016	9	167	131	190	172
[4a] Time-weighted average NMS size at the NBBO.	Aug 2015	19,257.66	2,609.35	6,511.42	18,471.79	9,197.52
	Sep 2015	11,919.38	1,679.93	6,540.46	14,223.92	7,481.44
	Oct 2015	18,309.27	2,468.56	6,972.46	19,848.75	9,763.26
	Nov 2015	19,257.58	3,930.75	6,963.92	23,442.48	11,445.72
	Dec 2015	13,230.66	2,204.20	5,812.28	17,106.74	8,374.40
	Jan 2016	9,513.33	2,569.26	5,221.94	14,100.46	7,297.22
	Feb 2016	7,417.60	2,489.46	6,340.40	13,869.32	7,566.40
	Mar 2016	8,638.39	3,703.26	8,521.28	20,316.43	10,846.99
	Apr 2016	9,876.59	3,070.53	9,422.71	23,246.57	11,913.27
	May 2016	9,398.26	3,144.93	10,295.88	28,354.88	13,931.90
	Jun 2016	9,313.10	3,107.54	9,597.43	28,288.57	13,664.51
	Jul 2016	11,685.53	4,711.37	10,026.35	35,353.64	16,697.12
[4b] Time-weighted average NMS size at the NBBO index: Jan 2016 = 100.	Aug 2015	202	102	125	131	126
	Sep 2015	125	65	125	101	103
	Oct 2015	192	96	134	141	134
	Nov 2015	202	153	133	166	157
	Dec 2015	139	86	111	121	115
	Jan 2016	100	100	100	100	100
	Feb 2016	78	97	121	98	104
	Mar 2016	91	144	163	144	149
	Apr 2016	104	120	180	165	163
	May 2016	99	122	197	201	191
	Jun 2016	98	121	184	201	187
	Jul 2016	123	183	192	251	229
[5a] % of time CHX had a two-sided market	Aug 2015	99.8%	99.6%	99.7%	99.6%	99.7%
	Sep 2015	99.9%	99.9%	99.9%	99.9%	99.9%
	Oct 2015	100.0%	99.9%	99.9%	100.0%	99.9%
	Nov 2015	99.9%	99.9%	99.5%	99.8%	99.7%
	Dec 2015	98.6%	98.3%	98.6%	98.6%	98.5%
	Jan 2016	100.0%	99.9%	99.9%	100.0%	99.9%
	Feb 2016	99.9%	100.0%	100.0%	100.0%	100.0%
	Mar 2016	99.8%	100.0%	100.0%	100.0%	100.0%
	Apr 2016	99.3%	99.9%	100.0%	99.8%	99.9%
	May 2016	85.2%	99.9%	100.0%	100.0%	100.0%
	Jun 2016	73.2%	99.9%	100.0%	100.0%	100.0%
	Jul 2016	74.0%	99.9%	100.0%	100.0%	100.0%
[5b] % of time CHX had a one-sided market ...	Aug 2015	0.1%	0.1%	0.0%	0.2%	0.1%
	Sep 2015	0.0%	0.0%	0.0%	0.0%	0.0%
	Oct 2015	0.0%	0.0%	0.0%	0.0%	0.0%
	Nov 2015	0.0%	0.0%	0.0%	0.2%	0.1%
	Dec 2015	0.0%	0.3%	0.0%	0.0%	0.1%
	Jan 2016	0.0%	0.1%	0.0%	0.0%	0.0%
	Feb 2016	0.0%	0.0%	0.0%	0.0%	0.0%
	Mar 2016	0.2%	0.0%	0.0%	0.0%	0.0%
	Apr 2016	0.2%	0.0%	0.0%	0.0%	0.0%
	May 2016	3.0%	0.0%	0.0%	0.0%	0.0%
	Jun 2016	6.1%	0.0%	0.0%	0.0%	0.0%
	Jul 2016	1.8%	0.0%	0.0%	0.0%	0.0%
[5c] % of time CHX had no market	Aug 2015	0.1%	0.3%	0.3%	0.1%	0.2%
	Sep 2015	0.0%	0.1%	0.1%	0.0%	0.1%

[No.] Calculation	Month	Symbol				
		SPY	DIA	IWM	QQQ	Control Average
		[1]	[2]	[3]	[4]	([2]:[4])
	Oct 2015	0.0%	0.1%	0.1%	0.0%	0.1%
	Nov 2015	0.1%	0.1%	0.4%	0.0%	0.2%
	Dec 2015	1.4%	1.4%	1.4%	1.4%	1.4%
	Jan 2016	0.0%	0.0%	0.0%	0.0%	0.0%
	Feb 2016	0.1%	0.0%	0.0%	0.0%	0.0%
	Mar 2016	0.0%	0.0%	0.0%	0.0%	0.0%
	Apr 2016	0.5%	0.1%	0.0%	0.2%	0.1%
	May 2016	11.8%	0.1%	0.0%	0.0%	0.0%
	Jun 2016	20.7%	0.1%	0.0%	0.0%	0.0%
	Jul 2016	24.2%	0.0%	0.0%	0.0%	0.0%
[6a] % of time CHX was at the NBB	Aug 2015	16.5%	32.7%	46.9%	58.0%	45.9%
	Sep 2015	24.0%	36.4%	44.7%	67.6%	49.6%
	Oct 2015	30.8%	45.8%	44.3%	74.9%	55.0%
	Nov 2015	24.5%	50.3%	54.0%	79.6%	61.3%
	Dec 2015	29.2%	34.1%	38.3%	71.3%	47.9%
	Jan 2016	23.8%	46.0%	40.2%	70.4%	52.2%
	Feb 2016	15.5%	53.9%	33.7%	65.5%	51.0%
	Mar 2016	18.5%	58.4%	35.6%	66.8%	53.6%
	Apr 2016	18.7%	46.8%	35.9%	60.5%	47.7%
	May 2016	7.0%	44.8%	53.5%	68.5%	55.6%
	Jun 2016	5.4%	47.1%	44.2%	72.8%	54.7%
	Jul 2016	8.2%	45.9%	40.8%	74.1%	53.6%
[6b] % of time CHX was at the NBO	Aug 2015	27.9%	39.8%	57.0%	65.6%	54.1%
	Sep 2015	29.7%	36.0%	41.8%	66.7%	48.2%
	Oct 2015	20.9%	41.4%	42.7%	74.0%	52.7%
	Nov 2015	28.7%	39.3%	52.9%	78.2%	56.8%
	Dec 2015	27.1%	35.5%	42.4%	70.0%	49.3%
	Jan 2016	23.3%	52.3%	48.8%	70.4%	57.2%
	Feb 2016	23.2%	55.5%	46.3%	69.1%	57.0%
	Mar 2016	19.0%	58.5%	44.4%	70.0%	57.7%
	Apr 2016	14.0%	44.0%	36.4%	65.8%	48.7%
	May 2016	12.4%	40.4%	49.3%	64.2%	51.3%
	Jun 2016	11.0%	47.3%	48.4%	74.6%	56.8%
	Jul 2016	5.8%	46.0%	34.0%	69.4%	49.8%
[6c] % of time CHX was at the NBB and that CHX was at the NBO.	Aug 2015	1.0%	8.2%	19.7%	32.5%	20.2%
	Sep 2015	2.0%	10.0%	9.2%	37.1%	18.8%
	Oct 2015	3.0%	14.4%	10.2%	49.8%	24.8%
	Nov 2015	6.0%	14.2%	17.9%	58.1%	30.1%
	Dec 2015	4.4%	9.3%	12.5%	44.8%	22.2%
	Jan 2016	3.3%	19.2%	7.8%	41.8%	22.9%
	Feb 2016	1.0%	24.5%	4.8%	35.4%	21.5%
	Mar 2016	0.5%	29.6%	4.6%	38.0%	24.1%
	Apr 2016	0.2%	15.7%	2.2%	29.9%	15.9%
	May 2016	0.0%	13.5%	17.5%	34.6%	21.9%
	Jun 2016	0.0%	17.0%	12.2%	48.5%	25.9%
	Jul 2016	0.0%	12.6%	4.0%	44.1%	20.3%
[7a] % of time CHX was at the NBB and was the largest bid at that price.	Aug 2015	13.6%	26.2%	37.1%	26.6%	29.9%
	Sep 2015	21.5%	34.0%	40.0%	47.6%	40.6%
	Oct 2015	24.9%	43.8%	36.2%	57.4%	45.8%
	Nov 2015	18.8%	47.9%	39.4%	55.9%	47.7%
	Dec 2015	25.1%	31.7%	27.7%	39.1%	32.8%
	Jan 2016	20.0%	43.6%	32.0%	48.1%	41.2%
	Feb 2016	11.2%	52.7%	28.5%	45.5%	42.2%
	Mar 2016	11.9%	55.7%	28.3%	44.8%	42.9%
	Apr 2016	13.0%	42.2%	31.6%	43.6%	39.1%
	May 2016	1.7%	39.8%	37.9%	50.2%	42.6%
	Jun 2016	2.0%	43.7%	32.2%	48.3%	41.4%
	Jul 2016	2.3%	43.2%	31.7%	48.0%	41.0%
[7b] % of time CHX was at the NBO and was the largest offer at that price.	Aug 2015	24.3%	34.4%	51.2%	39.8%	41.8%
	Sep 2015	27.0%	33.8%	37.8%	46.7%	39.4%
	Oct 2015	16.0%	38.1%	31.3%	44.0%	37.8%
	Nov 2015	22.6%	36.8%	35.1%	53.4%	41.8%
	Dec 2015	23.2%	32.7%	30.6%	36.8%	33.4%
	Jan 2016	20.7%	51.1%	41.3%	50.7%	47.7%
	Feb 2016	18.5%	54.7%	40.8%	49.4%	48.3%
	Mar 2016	12.9%	55.2%	35.3%	51.2%	47.2%
	Apr 2016	8.1%	38.6%	30.8%	45.9%	38.4%

[No.] Calculation	Month	Symbol				
		SPY	DIA	IWM	QQQ	Control Average
		[1]	[2]	[3]	[4]	([2]:[4])
[7c] % of time CHX was at the NBB and was the largest bid at that price and that CHX was at the NBO and was the largest offer at that price.	May 2016	3.8%	36.7%	29.8%	45.2%	37.2%
	Jun 2016	4.6%	44.6%	31.4%	51.8%	42.6%
	Jul 2016	1.1%	42.5%	27.0%	31.0%	33.5%
	Aug 2015	0.2%	5.3%	12.8%	7.1%	8.4%
	Sep 2015	1.1%	8.5%	7.3%	16.7%	10.9%
	Oct 2015	0.9%	12.3%	5.3%	17.7%	11.8%
	Nov 2015	2.3%	12.6%	7.0%	23.0%	14.2%
	Dec 2015	2.9%	8.1%	6.4%	13.7%	9.4%
	Jan 2016	1.9%	17.3%	4.3%	18.5%	13.4%
	Feb 2016	0.3%	23.3%	2.8%	13.9%	13.3%
	Mar 2016	0.1%	26.0%	2.6%	14.0%	14.2%
	Apr 2016	0.0%	10.9%	1.5%	14.0%	8.8%
	May 2016	0.0%	10.4%	8.0%	15.6%	11.3%
	Jun 2016	0.0%	14.3%	4.8%	18.6%	12.5%
	Jul 2016	0.0%	10.7%	2.8%	10.8%	8.1%

Appendix C: Impact of LEAD on Liquidity Takers

The purpose of this analysis is to show that implementation of LEAD would not materially impact the ability of a random market participant not engaged in a latency arbitrage strategy, such as retail investors, to take displayed liquidity at CHX. This analysis assumes that LEAD would not materially change order sending behavior of Participants.

For the period of May 2016 through July 2016,[97] the Exchange observed the following with regards to SPY:

- There were a total of 18,316 orders at least partially executed.
- During the same period, the Exchange received 1,278 cancel messages to cancel resting orders after the resting order had been fully executed (''too-late-to-cancel'' or ''TLTC'').
- Of the 1,278 TLTCs, 412 TLTCs (32.24%) were received sooner than or exactly 350 microseconds after the execution (''$TLTC_{\leq 350}$''), whereas 866 (67.76%) were received later than 350 microseconds after the execution (''$TLTC_{>350}$'').
- Of the 412 $TLTC_{\leq 350}$, 392 (95.15%) executions were attributed to SPY latency arbitrage activity while the remaining 20 (4.85%) executions were not.
- Of the 866 $TLTC_{>350}$, 780 (90.07%) executions were attributed to SPY latency arbitrage activity while the remaining 86 (9.93%) executions were not.

Thus, if LEAD had been in effect for the period of May 2016 through July 2016, LEAD (1) would have prevented up to 412 orders, virtually all of which the Exchange believes were submitted as part of SPY latency arbitrage activity, from being executed during the 350 microsecond Fixed LEAD Period and (2) would have had a negative impact on only 20 liquidity taking orders not attributed to SPY latency arbitrage activity. These 20 orders comprised 0.11% of the 18,316 orders executed during the period. That is, during the measurement period of 63 trading days, LEAD would have had an adverse effect on approximately one order every three trading days. Thus, LEAD can make a significant contribution to leveling the playing field between LEAD MMs and latency arbitrageurs with minimal adverse effect on other liquidity taking orders.

2. Statutory Basis

The Exchange believes that the proposed rule change is consistent with Section 6(b) of the Act in general,[98] and furthers the objectives of Section 6(b)(5) in particular,[99] in that it is designed to promote just and equitable principles of trade, to foster cooperation and coordination with persons engaged in facilitating transactions in securities, to remove impediments and perfect the mechanisms of a free and open market, and, in general, to protect investors and the public interest; and is not designed to permit unfair discrimination between customers, issuers, brokers, or dealers.

Specifically, the Exchange believes that the proposed rule change would remove impediments and perfect the mechanisms of a free and open market and, in general, protect investors and the public interest by enhancing displayed liquidity and price discovery by minimizing the effectiveness of latency arbitrage strategies that negatively impact market quality. As shown under the CHX ETF Analysis,[100] latency arbitrage lessens competition among orders by dissuading liquidity providers from displaying large and aggressively priced orders, which in turn impairs market efficiency.[101] The Commission has recognized the crucial role that displayed limit orders play in the price discovery process.[102] Thus, the Exchange believes that optimizing liquidity provision on the Exchange will enhance price discovery and, thereby, enhance market efficiency. To this end, LEAD is designed to promote displayed liquidity on the Exchange by giving LEAD MMs a small head start to the cancellation of stale quotes in the race to react to symmetric public information. LEAD is designed to achieve these goals without having a materially negative impact on the ability of liquidity takers not engaged in latency arbitrage, such as retail investors, to access displayed liquidity at CHX, as such liquidity will most always remain on the CHX book after a liquidity taking order has been released from LEAD.[103] Thus, the Exchange believes that LEAD will encourage LEAD MMs to post large aggressively priced orders on the CHX book, which

[97] For the months prior to May 2016 during the Analysis Period, the Exchange did not maintain TLTC data. A limitation of this data is that CHX Market Share and displayed liquidity in SPY and, by extension, order sending activity had all diminished considerably by May 2016. *See supra* Appendix B Calculation Set 1.

[98] 15 U.S.C. 78f(b).

[99] 15 U.S.C. 78f(b)(5).

[100] *See supra* Appendix A

[101] *See* Regulation NMS Adopting Release, *supra* note 13, at 37499.

[102] *See* Regulation NMS Adopting Release, *supra* note 13, at 37526.

[103] *See also supra* note 18; *see also supra* Appendix C.

will enhance liquidity and optimize price discovery in furtherance of the objectives of Section 6(b)(5) of the Act [104] and in a manner consistent with Regulation NMS, as described below.

In addition, the Exchange believes that the proposed LEAD MM designation would protect investors and the public interest by requiring LEAD MMs to meet the proposed Minimum Performance Standards in return for being afforded the benefits of LEAD. Moreover, the Exchange submits that the proposal to leverage existing Market Maker rules regarding the procedures for deregistering Market Makers and involuntary withdrawals from assigned securities will provide the Exchange with sufficient authority to compel and enforce compliance by LEAD MMs with the proposed Minimum Performance Standards.

The Exchange also believes that the proposed rules regarding assignment of LEAD MM Securities would protect investors and the public interest by implementing a comprehensive process whereby the Exchange will be able to select LEAD MMs that have demonstrated the ability and capacity to enhance displayed liquidity on the Exchange and to comply with federal rules and regulations, as well as CHX Rules. When considering these procedures with the proposed Minimum Performance Standards and enforcement mechanism, the Exchange believes that the effectiveness of LEAD in enhancing displayed liquidity and price discovery will be optimized.

Moreover, for similar reasons, the Exchange submits that the proposed rules for LEAD are not designed to permit unfair discrimination. Specifically, the Exchange believes that any discrimination between LEAD MMs and non-LEAD MMs is permissible under the Act because (1) LEAD is designed to enhance displayed liquidity and price discovery by rectifying a current structural bias against displayed liquidity,[105] without having a materially negative impact on the ability of liquidity takers not engaged in latency arbitrage, such as retail investors, to access displayed liquidity at CHX,[106] and (2) the proposed Minimum Performance Standards, which will not apply to non-LEAD MMs, will help ensure that those goals are achieved, as well as to provide a safeguard against LEAD MMs utilizing LEAD to engage in manipulative activities or otherwise non-bona fide liquidity provision strategies.

Regardless of whether a delay is symmetric (*e.g.,* IEX Delay) or asymmetric (*e.g.,* LEAD), any intentional delay designed to address latency arbitrage must necessarily discriminate among members. That is, correcting asymmetry in the market requires asymmetry in the remedy. For example, while the IEX Delay delays all incoming messages, the IEX Delay is asymmetric in that it provides processing advantages to non-displayed pegged orders resting on the IEX book, which are not provided to other orders. LEAD would similarly address latency arbitrage by providing a processing advantage to LEAD MMs, which will not be provided to non-LEAD MMs.

The Exchange also believes that the LEAD is narrowly-tailored to address latency arbitrage as applied to limit orders. In finding that the rules pertaining to the IEX Delay did not permit unfair discrimination, and would not impose any unnecessary or inappropriate burden on competition, the Commission recognized that displayed limit orders or non-pegged non-displayed limit orders, the types of liquidity LEAD is designed to protect, would not benefit from the symmetric IEX Delay [107] because the purpose of such limit orders is to post or execute consistent with their fixed limit price, as opposed to being repriced by an exchange based on changes to the NBBO.[108] Given that limit orders are also vulnerable to latency arbitrage and could only be effectively adjusted by the liquidity providers, if such orders are provided as part of a broader liquidity provision strategy that utilizes proprietary algorithms to price and size such limit orders, it logically flows that the best way to protect such liquidity is through an asymmetric delay, such as LEAD, that empowers LEAD MMs to better execute their liquidity provision strategies, which result in valuable displayed liquidity being provided to the market.[109] Thus, given the ineffectiveness of symmetric delays in protecting limit orders from latency arbitrage and the immaterial impact that LEAD would have on the ability of random liquidity takers not engaged in latency arbitrage to access liquidity at CHX,[110] the Exchange believes that LEAD is narrowly-tailored to address latency arbitrage as applied to limit orders.

The Exchange further submits that LEAD would not confer any unfair advantage to LEAD MMs or introduce incremental risk of manipulative activity. While LEAD is long enough to neutralize microsecond speed advantages exploited by latency arbitrageurs, it is too short to provide any actionable incremental advantage to LEAD MMs in reacting to information not already it their possession. LEAD is also too short to introduce any incremental risk of manipulative practices, which is supported by the fact that the Commission has recognized that a 350-microsecond delay would not materially increase the likelihood of certain manipulative practices such as ''spoofing'' or ''marking-the-close'' due to the practical difficulties of executing such strategies within such a short time frame.[111] [112] Notwithstanding, the Exchange has elected to adopt the proposed Minimum Performance Standards to provide additional assurance to the Commission that CHX displayed liquidity will remain valuable and reliable by tying the processing advantage afforded to LEAD MMs to heightened market quality requirements, which will not be applied to non-LEAD MMs. Thus, for all of the reasons described above, any discrimination between LEAD MMs and non-LEAD MMs is justified and consistent with the requirements of the Section 6(b)(5) of the Act.[113]

The Exchange notes that the Commission has previously approved functionality that permissibly discriminates among members for the purpose enhancing displayed liquidity. Specifically, the Commission has previously approved the following mechanisms:

- *Maker/taker fee.* Many national securities exchanges, including CHX, utilize the ''maker/taker'' fee model, which discriminates between liquidity providers and takers for the purpose of incentivizing market participants to provide liquidity to or take liquidity from the exchange.[114]
- *Bulk-quoting interface.* Nasdaq offers a bulk-quoting interface to allow its options market makers to more efficiently submit and update quotes as ''aiding market makers in their market making activities will help to

[104] 15 U.S.C. 78f(b)(5).

[105] *See supra* Section 3(a)(2).

[106] *See also supra* note 18; *see also supra* Appendix C.

[107] *See* IEX Approval Order, *supra* note 20, at 41157.

[108] *See id.*

[109] *See supra* notes 7 and 8.

[110] *See also supra* note 18; *see also supra* Appendix C.

[111] Final Interpretation, *supra* note 30, at n. 70.

[112] The Exchange notes that it currently maintains surveillance protocols designed to detect such manipulative practices.

[113] 15 U.S.C. 78f(b)(5).

[114] *See, e.g.,* Bats BYX Fee Schedule; *see also* Section E.1 of the CHX Fee Schedule.

enhance market liquidity for investors.'' [115] BATS Options offers a similar functionality, but permits all BATS Options users to utilize its bulk-quoting interface.[116] In each case, the exchange gives liquidity providers a processing advantage to facilitate the adjusting of stale quotes to the disadvantage of liquidity takers. Consequently, as bulk-quoting interfaces permit liquidity providers to adjust numerous quotes through a single message, this would minimize the possibility of stale quotes being executed before the liquidity provider has an opportunity to adjust the stale quote. That is, bulk-quoting interfaces, among other things, minimize the effectiveness of latency arbitrage strategies.

• *Market Makers generally.* Many national securities exchange offer a market maker program that provides certain financial or operational benefits (*e.g.,* Nasdaq's bulk-quoting interface and NYSE DMM parity [117]) in return for meeting heightened market quality requirements.

The Exchange also believes that the proposed amendments to the MTP order modifier would remove impediments and perfect the mechanisms of a free and open market and, in general, protect investors and the public interest, in that they are designed to avoid certain unintended consequences of LEAD on the MTP functionality. Specifically, since an order would be assigned a sequence number prior to being evaluated pursuant to LEAD,[118] LEAD may result in a newer undelayed order being ranked on the CHX book before an older delayed order, which would not otherwise occur today. Under this scenario and assuming that the contra-side orders trigger MTP and the incoming order is marked ''N,'' the current MTP rules would require the incoming older order to be cancelled, whereas the amended MTP handling would require the resting newer order to be cancelled subject to the exception for CHX Only orders described under amended Article 1, Rule 2(b)(3)(F)(iii)(a) and (b). Thus, the Exchange believes that the amended MTP functionality better contemplates LEAD and preserves expected results.

The Exchange also believes that the proposed rule change is consistent with Regulation NMS. Specifically, the Exchange believes that LEAD is consistent with Rule 600(b)(3),[119] Rule 602(b)(2) (''Firm Quote Rule''),[120] Rule 611 [121] and Rule 610(d).[122]

The Exchange believes that the proposed rule change is consistent with the ''immedia[cy]'' requirement of Rule 600(b)(3) as LEAD is a *de minimis* intentional access delay and thereby compatible with the Exchange having an ''automated quotation'' under Rule 600(b)(3) and thus a ''protected quotation'' under Rule 611.[123] Specifically, Rule 600(b)(3) requires that a trading center displaying an automated quotation permit, among other things, an incoming IOC order to immediately and automatically execute against the automated quotation up to its full size; and immediately and automatically cancel any unexecuted portion of the IOC order without routing the order elsewhere.[124] In the context of determining whether a trading center maintains an ''automated quotation'' for purposes of Rule 611, the Commission does not interpret the term ''immediate'' used in Rule 600(b)(3) by itself to prohibit a trading center from implementing an intentional access delay that is *de minimis* (*i.e.,* a delay so short as to not frustrate the purposes of the Order Protection Rule by impairing fair and efficient access to an exchange's quotations).[125] Accordingly, the Commission's revised interpretation provides that the term ''immediate'' precludes any coding of automated systems or other type of intentional device that would delay the action taken with respect to a quotation unless such delay is *de minimis.*[126]

The Exchange believes that LEAD is so short as to not frustrate the purposes of the Rule 611 [127] by impairing fair and efficient access to the Exchange's quotations. Specifically, all Participants seeking to take liquidity from the CHX book will have fair and efficient access to CHX quotations. Also, the 350-microsecond delay is so short that it does not provide an incremental advantage to a LEAD MM other than neutralizing a structural bias that permits latency arbitrageurs to profit off of symmetric public information. To the extent a market participant has a better algorithm or better information, LEAD is too short to have a negative impact on such non-latency arbitrage strategies, much less permit a LEAD MM to decide on a quotation-by-quotation basis whether to cancel or modify a quote. In addition, LEAD is narrowly-tailored to minimize the effectiveness of latency arbitrage strategies at CHX, as described above.

The Exchange also believes that LEAD is consistent with Rule 602(b)(2).[128] Specifically, a plain reading of Rule 602(b) indicates that the delay of a liquidity taking order pursuant to LEAD would not result in the order being ''presented'' to the LEAD MM.[129] This is consistent with the Commission's guidance regarding the applicability of the Firm Quote Rule in the context of obsolete Intermarket Trading System (''ITS'') commitments.[130] Specifically, the Commission stated that ''the Firm Quote Rule requires that every exchange specialist or OTC market maker execute any order to buy or sell a security it *receives* at a price at least as favorable as its published bid or offer in any amount up to its published size, subject to two exceptions.'' [131] The Commission further stated ''that the Firm Quote Rule applies to ITS commitments; where a specialist or market maker fails to honor its quote by *refusing* to execute an ITS commitment received at its published bid or offer, and neither of the exceptions contained in the Firm Quote Rule apply, the specialist or market maker is in violation of the Firm Quote Rule.'' [132] As such, the Commission's guidance clearly suggests that a Rule 602(b) violation occurs when a liquidity provider receives (*i.e.,* is presented) a marketable contra-side order and refuses to honor its quote.[133] When also

[115] *See* Securities Exchange Act Release No. 65024 (August 3, 2011), 76 FR 48925 (August 9, 2011) (SR–NASDAQ–2011–102).

[116] *See* Securities Exchange Act Release No. 65307 (September 9, 2011), 76 FR 57092 (September 15, 2011) (SR–BATS–2011–034) (expanding the availability of the bulk-quoting interface to all users of BATS Options); Securities Exchange Act Release No. 65133 (August 15, 2011), 76 FR 52032 (August 19, 2011) (SR–BATS–2011–029) (adopting the bulk-quoting interface).

[117] *See* NYSE Rules 103B and 104.

[118] *See supra* note 45.

[119] *See* 17 CFR 242.600(b)(3).

[120] *See* 17 CFR 242.602(b)(2).

[121] *See* 17 CFR 242.611.

[122] *See* 17 CFR 242.610(d).

[123] *See* Final Interpretation, *supra* note 30, at 40792.

[124] *See* 17 CFR 242.600(b)(3).

[125] *See* Final Interpretation, *supra* note 30, at 40792. Thus, the Exchange's quotations would continue to be ''immediately'' accessible and protected pursuant to Rule 611. *See* 17 CFR 242.600(b)(3) defining ''automated quotation''; *see also* 17 CFR 242.600(b)(58) defining ''protected quotation.''

[126] *See* Final Interpretation, *supra* note 30, at 40792.

[127] *See* 17 CFR 242.611.

[128] ''Subject to the provisions of paragraph (b)(3) of this section, each responsible broker or dealer shall be obligated to execute any order to buy or sell a subject security, other than an odd-lot order, *presented to it by another broker or dealer,* or any other person belonging to a category of persons with whom such responsible broker or dealer customarily deals, at a price at least as favorable to such buyer or seller as the responsible broker's or dealer's published bid or published offer (exclusive of any commission, commission equivalent or differential customarily charged by such responsible broker or dealer in connection with execution of any such order) in any amount up to its published quotation size.'' 17 CFR 242.602(b)(2) (emphasis added).

[129] *See* 17 CFR 242.602(b).

[130] *See* Exchange Act Release No. 40260, 63 FR 40748, 40754 (July 30, 1998).

[131] *Id* (emphasis added).

[132] *Id* (emphasis added).

[133] *See* 17 CFR 242.602(b). A Section 21(a) report from 1996 regarding, among other things, misconduct by certain market makers with respect to its published quotes is illustrative of the type of activity that the Firm Quote Rule is designed to

considering that the Exchange will never notify Participants or the public of the Exchange's receipt of a liquidity taking order subject to LEAD and CHX Rules indicate that a liquidity provider's Rule 602(b) obligation vests only after execution of its order within the Matching System,[134] the Exchange submits that LEAD is consistent with the Firm Quote Rule.

The Exchange further believes that LEAD is consistent with the requirements of Rule 611.[135] As described above, a portion of a Routable Order may be immediately routed away to execute against away protected quotations, with the unrouted remainder being delayed before being permitted to execute against an order resting on the CHX book at a price inferior to the away protected quotations. [136] Given that LEAD is *de minimis* in the context of Rule 600(b)(3),[137] it logically flows that LEAD would also be considered *de minimis* for the purposes of the ''simultaneously routed'' Intermarket Sweep Order (''ISO'') requirement under Rule 611(b)(6).[138] Thus, the Exchange submits that a delay caused by LEAD between the routing of one or more ISOs to satisfy better priced protected quotation(s) and the delayed execution of a related order at price inferior to such protected quotation(s) is consistent with the requirements of Rule 611(b)(6).[139]

Similarly, a portion of a Routable Order may be immediately routed away to execute against away protected quotations with the unrouted remainder being delayed before be ranked on the CHX book at a price that crosses such away protected quotations. This could result if the resting order on the CHX book that resulted in the unrouted remainder being delayed was cancelled before the unrouted remainder were released from LEAD. Under this scenario, given that LEAD is *de minimis* in the context of Rule 600(b)(3),[140] it logically flows that the *de minimis* delay caused by LEAD between the routing of one or more ISOs to satisfy away protected quotations and the display of the related order at a price that crosses such away protected quotations is permissible and consistent with the requirements of Rule 610(d).[141]

B. Self-Regulatory Organization's Statement on Burden on Competition

The Exchange does not believe that the proposed rule change will impose any burden on competition that is not necessary or appropriate in furtherance of the purposes of the Act. To the contrary, the Exchange believes that any burden on competition is necessary and appropriate in furtherance of the purposes of Section 6(b)(5) of the Act because LEAD is functionality that seeks to enhance liquidity and optimize price discovery by deemphasizing speed as a key to trading success in order to further serve the interests of investors and thereby removes impediments and perfects the mechanisms of a free and open market.

The Exchange further notes that market participants will continue to be able to obtain CHX book data via the Securities Information Processors or through the Exchange's proprietary book feed, the CHX Book Feed,[142] without delay as the Exchange does not propose to delay any outbound messages or market data. As such, the Exchange submits that any burden on competition, while necessary and appropriate in furtherance of the purposes of that Act, has been minimized.

C. Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received From Members, Participants or Others

No written comments were solicited or received with respect to the proposed rule change.

III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

Within 45 days of the date of publication of this notice in the **Federal Register** or within such longer period (i) as the Commission may designate up to 90 days of such date if it finds such longer period to be appropriate and publishes its reasons for so finding or (ii) as to which the self-regulatory organization consents, the Commission will:

A. By order approve or disapprove the proposed rule change, or

B. Institute proceedings to determine whether the proposed rule change should be disapproved.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views, and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Act. Comments may be submitted by any of the following methods:

Electronic Comments

- Use the Commission's Internet comment form (*http://www.sec.gov/rules/sro.shtml*); or
- Send an email to *rule-comments@sec.gov.* Please include File Number SR–CHX–2017–04 on the subject line.

Paper Comments

- Send paper comments in triplicate to Secretary, Securities and Exchange Commission, 100 F Street NE., Washington, DC 20549–1090.

All submissions should refer to File Number SR–CHX–2017–04. This file number should be included on the subject line if email is used. To help the Commission process and review your comments more efficiently, please use only one method. The Commission will post all comments on the Commission's Internet Web site (*http://www.sec.gov/rules/sro.shtml*). Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for Web site viewing and printing in the Commission's Public Reference Room, 100 F Street NE., Washington, DC 20549, on official business days between the hours of 10:00 a.m. and 3:00 p.m. Copies of the

address. *See* Report Pursuant to Section 21(a) of the Securities Exchange Act of 1934 Regarding the NASD, the Nasdaq Market, and Nasdaq Market Makers, Exchange Act Release No. 37542 (August 8, 1996). Page 32 of the report provides, in pertinent part, as follows: Certain market makers at times did not honor their quotation for those with whom they preferred not to trade and ''backed away'' from their quotes as reprisal for, among other reasons, perceived prior back way by other market makers. Certain market makers also variously refused to trade with order entry firms, certain other market makers, and participants they ''dislike,'' such as options market makers. Market makers at times backed away from their trading obligations to avoid unwanted orders placed when they coordinated their quotations with other market makers.

[134] CHX Article 20, Rule 3(a) provides as follows: Each order submitted by each Participant is a firm order and each Participant must, upon execution of the order within the Matching System, purchase or sell, as the case may be, at the price, size and conditions identified by the participant at the time it submitted the order. No Participant may submit an order marked for display as a ''manual'' quotation.

[135] 17 CFR 242.611.

[136] *See supra* Example 3.

[137] *See* 17 CFR 242.600(b)(3).

[138] *See* 17 CFR 242.611(b)(6).

[139] *See id.*

[140] *See* 17 CFR 242.600(b)(3).

[141] *See* ''Division of Trading and Markets: Responses to Frequency Asked Questions Concerning Rule 611 and Rule 610 of Regulation NMS.'' U.S. Securities and Exchange Commission, 4 April 2008. Web. 20 June 2016 *http://www.sec.gov/divisions/marketreg/nmsfaq610-11.htm* (''Question 5.02''); *see also* CHX Article 20, Rule 6(c)(3); *see also* 17 CFR 242.610(d).

[142] *See* CHX Article 4, Rule 1.

filing also will be available for inspection and copying at the principal office of the Exchange. All comments received will be posted without change; the Commission does not edit personal identifying information from submissions. You should submit only information that you wish to make available publicly. All submissions should refer to File Number SR–CHX–2017–04 and should be submitted on or before March 14, 2017.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.[143]

Eduardo A. Aleman,

Assistant Secretary.

[FR Doc. 2017–03296 Filed 2–17–17; 8:45 am]

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SECURITIES AND EXCHANGE COMMISSION

[Release No. 34–80035; File No. SR–PEARL–2017–09]

Self-Regulatory Organizations; MIAX PEARL, LLC; Notice of Filing and Immediate Effectiveness of a Proposed Rule Change To Amend the MIAX PEARL Fee Schedule To Establish an Options Regulatory Fee (''ORF'')

February 14, 2017.

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 (the ''Act''),[1] and Rule 19b–4 thereunder,[2] notice is hereby given that on February 3, 2017, MIAX PEARL, LLC (''MIAX PEARL'' or ''Exchange'') filed with the Securities and Exchange Commission (the ''Commission'') the proposed rule change as described in Items I, II, and III below, which Items have been prepared by the Exchange. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

I. Self-Regulatory Organization's Statement of the Terms of Substance of the Proposed Rule Change

The Exchange is filing a proposal rule change to amend the MIAX PEARL Fee Schedule (the ''Fee Schedule'') by establishing an Options Regulatory Fee (''ORF'').

While changes to the Fee Schedule pursuant to this proposal are effective upon filing, the Exchange has designated these changes to be operative February 6, 2017.

The text of the proposed rule change is available on the Exchange's Web site at *http://www.miaxoptions.com/rule-filings/pearl,* at MIAX's principal office, and at the Commission's Public Reference Room.

II. Self-Regulatory Organization's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, the Exchange included statements concerning the purpose of and basis for the proposed rule change and discussed any comments it received on the proposed rule change. The text of these statements may be examined at the places specified in Item IV below. The Exchange has prepared summaries, set forth in sections A, B, and C below, of the most significant aspects of such statements.

A. Self-Regulatory Organization's Statement of the Purpose of, and the Statutory Basis for, the Proposed Rule Change

1. Purpose

The purpose of the proposed rule change is to establish an ORF in the amount of $0.0010 per contract side. The per-contract ORF will be assessed by MIAX PEARL to each MIAX PEARL Member for all options transactions executed, cleared, or ultimately cleared by the Member which are cleared by OCC in the ''customer'' range, regardless of the exchange on which the transaction occurs. The ORF will be collected indirectly from Members through their clearing firms by OCC on behalf of MIAX PEARL.

In the case where a non-Member executes a transaction and a Member clears the transaction, the ORF will be assessed to the Member who clears the transaction. In the case where a Member executes a transaction and another Member clears the transaction, the ORF will be assessed to the Member who clears the transaction. Further, the ORF will be assessed on transactions that are not executed by a Member, but are ultimately cleared by a Member. The Exchange notes that, in the limited circumstance in which a Member executes or clears a transaction and then ''gives-up'' or ''CMTAs'' the trade to a non-member of MIAX PEARL (which non-member becomes the ultimate clearing firm for the transaction), MIAX PEARL will collect the ORF from such non-member involving [sic] that transaction. However, for the avoidance of doubt, the Exchange will not assess the ORF when the transaction is not executed on the Exchange and neither the executing clearing firm nor the ultimate clearing firm (*e.g.,* such as when the Member is ''given-up'' or ''CMTAed'' and then subsequently ''gives-up'' or ''CMTAs'' the transaction to another non-member via a CMTA reversal) is a Member. Further, the Exchange will not assess the ORF on linkage trades, whether executed at the Exchange or an away exchange. A customer order routed to another exchange results in two customer trades, one from the originating exchange and one from the recipient exchange. Charging ORF on both trades could result in double-billing of ORF for a single customer order, thus the Exchange chooses not to charge ORF on the trade from the originating exchange in a linkage scenario. This assessment practice will be identical to the assessment practice currently utilized by the Exchange's affiliate, Miami International Securities Exchange, LLC (''MIAX Options'').

As a practical matter, when a transaction that is subject to the ORF is not executed on the Exchange, the Exchange lacks the information necessary to identify the executing member for that transaction. There are countless executing market participants, and each day such participants can and often do drop their connection to one market center and establish themselves as participants on another. For these reasons, it is not possible for the Exchange to identify, and thus assess fees such as an ORF on, executing participants on away markets on a given trading day.

Clearing members, however, are distinguished from executing participants because they remain identified to the Exchange regardless of the identity of the initiating executing participant, their location, and the market center on which they execute transactions. Therefore, the Exchange believes it is more efficient for the operation of the Exchange and for the marketplace as a whole to collect the ORF from clearing members.

As discussed below, the Exchange believes it is appropriate to charge the ORF only to transactions that clear as customer at the OCC. The Exchange believes that its broad regulatory responsibilities with respect to a Member's activities supports applying the ORF to transactions cleared but not executed by a Member. The Exchange's regulatory responsibilities are the same regardless of whether a Member executes a transaction or clears a transaction executed on its behalf. The Exchange regularly reviews all such activities, including performing surveillance for position limit violations, manipulation, front-running, contrary exercise advice violations and

[143] 17 CFR 200.30–3(a)(12).

[1] 15 U.S.C. 78s(b)(1).

[2] 17 CFR 240.19b–4.