October 28, 2016

Brent J. Fields
Secretary
U.S. Securities and Exchange Commission
100 F Street, NE
Washington, DC 20549

Re: File No. SR-CHX-2016-16; Self-Regulatory Organizations; Chicago Stock Exchange, Inc.; Notice of Filing of Proposed Rule Change to Adopt the CHX Liquidity Taking Access Delay (Release No. 34-78860; File No. SR-CHX-2016-16)

Dear Mr. Fields:

The Chicago Stock Exchange, Inc. (the "Exchange" or "CHX") respectfully submits this letter in response to comments submitted by various market participants and academics on the proposed rule change[1] to implement the CHX Liquidity Taking Access Delay ("LTAD"). LTAD is an intentional delay designed to minimize the effectiveness of latency arbitrage[2] and thereby enhance displayed liquidity and price discovery. Specifically, LTAD would require all new liquidity taking orders, as well as certain related cancel messages, to be intentionally delayed for 350 microseconds before such delayed messages would be processed by the CHX Matching System. All other messages, including new liquidity providing orders and cancel messages for resting orders, would be immediately processed without delay. LTAD is similar to the Investor Exchange POP/Coil Delay ("IEX Delay"),[3] in that both employ a 350-microsecond delay to protect resting liquidity from latency arbitrage. However LTAD differs from the IEX Delay in that LTAD is designed to protect displayed liquidity, whereas the IEX Delay is not. Given that promoting displayed liquidity is a principal goal of Regulation NMS,[4] the Exchange proposes to implement LTAD for all securities traded on CHX.

The Exchange is grateful for the favorable comment letters that have been submitted in support of LTAD, which include letters from a leading global market maker and distinguished

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[1] See Securities Exchange Act Release No. 78860 (September 16, 2016), 81 FR 65442 (September 22, 2016) (SR-CHX-2016-16) ("Notice").

[2] As used herein and described in detail below, "latency arbitrage" means the practice of exploiting 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 market information. See Notice, supra note 1, at n. 3. As applied to CHX, latency arbitrage is effected by low-latency market participants that leverage microsecond speed advantages solely to take resting liquidity at stale prices from the CHX limit order book.

[3] See Securities Exchange Act Release No. 78101 (June 17, 2016), 81 FR 41141, 41157 (June 23, 2016) ("IEX Approval Order").

[4] The U.S. Securities and Exchange Commission ("SEC" or "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").

academics from the most prestigious U.S. business schools.[5] The Exchange also appreciates the comment letters that have been critical of LTAD as the Exchange welcomes a constructive dialogue regarding its proposal. As such, the Exchange would like to take this opportunity to specifically respond to two comment letters from Hudson River Trading, LLC ("HRT")[6] and Citadel Securities ("Citadel").[7] The Exchange will also respond to other material points made by other commenters throughout this letter.

I. Overview

As summarized immediately below and discussed in detail in the following sections, the Exchange submits that LTAD is consistent with the requirements of Section 6(b)(5) of the Securities and Exchange Act of 1934 ("Act")[8] and Regulation NMS thereunder for the following reasons:

- **Latency arbitrage results in market failure and is inconsistent with the objectives of the Act and Regulation NMS**. Latency arbitrage is built-in to the current market structure, which is biased in favor of latency arbitrageurs. Latency arbitrage imposes a tax on liquidity provision that diminishes displayed liquidity, which is contrary to the protection of investors and the public interest and is incompatible with a primary goal of Regulation NMS to enhance displayed liquidity. LTAD is designed to neutralize latency arbitrage by giving liquidity providers a tiny head start to the cancellation of stale quotes in the race to react to symmetric public information.

- **LTAD is not unfairly discriminatory**. Consistent with Section 6(b)(5) of the Act, LTAD will be applied to all liquidity taking orders submitted by all Participants and, thus, does not unfairly discriminate among Participants. To the contrary, LTAD permissibly discriminates between liquidity providing orders and liquidity taking orders to the benefit of the investors and the public interest, as LTAD is designed to enhance displayed liquidity and price discovery. Moreover, the Commission has already found that the IEX Delay does not unfairly discriminate among IEX members, even though the IEX Delay provides processing advantages to certain liquidity providers over liquidity takers. In addition, the Commission has previously approved various initiatives that discriminate between liquidity providing orders and liquidity taking orders for the purpose of incentivizing liquidity provision.

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5 All comment letters may be found at https://www.sec.gov/comments/sr-chx-2016-16/chx201616.shtml.

6 See Letter to Brent J. Fields, Secretary, SEC, from Adam Nunes, Head of Business Development, Hudson River trading, LLC (October 6, 2016) ("HRT Letter").

7 See Letter to Brent J. Fields, Secretary, SEC, from Adam C. Cooper, Senior Managing Director and Chief Legal Officer, Citadel Securities (October 13, 2016) ("Citadel Letter").

8 15 U.S.C. 78f(b)(5).

- **LTAD will protect investors and the public interest and does not introduce incremental risk of manipulative acts or practices.** Consistent with Section 6(b)(5) of the Act, LTAD will protect investors and the public interest by enhancing displayed liquidity and price discovery. Moreover, LTAD will not introduce any incremental risk of manipulative acts, but rather, will support the current CHX Market Data Revenue ("MDR") Rebates program[9] in promoting bona fide and aggressively-priced displayed liquidity at CHX.

- **LTAD is consistent with Rule 602(b) of Regulation NMS (the "Firm Quote Rule")**. LTAD will never result in a liquidity provider being "presented," as the term is used under the Firm Quote Rule, with a marketable contra-side order prior to its release from the LTAD. Thus, LTAD is absolutely not a "last look mechanism" nor does it facilitate "backing away" from firm quotes.

- **LTAD is a de minimis intentional delay and is consistent with the Rule 611 of Regulation NMS (the "Order Protection Rule").** LTAD is so short as to not frustrate fair and efficient access to the Exchange's quotations. Specifically, LTAD would not provide an incremental advantage to liquidity providers other than minimizing the possibility of stale quotes being executed by latency arbitrageurs. Moreover, LTAD is narrowly-tailored to minimize the effectiveness of latency arbitrage strategies at CHX, as supported by the Appendix C analysis under the Notice[10] and described below.

II. Latency Arbitrage Results in Market Failure and Frustrates the Objectives of Regulation NMS

Latency arbitrage imposes a tax on liquidity provision[11] 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.[12] The Exchange believes that the national market system is structurally (and unintendedly) biased in favor of latency arbitrage. Specifically, latency arbitrageurs exploit the

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[9] See Section P of the CHX Fee Schedule; see also Exchange Act Release No. 70546 (September 27, 2013), 78 FR 61413 (October 3, 2013) (SR-CHX-2013-18) ("MDR Rebates Notice").

[10] As described under the Appendix C analysis under the Notice, if LTAD had been applied to CHX trading in SPY during the period of May through July 2016, a total of 20 executions attributed to liquidity takers not engaged in SPY latency arbitrage strategies would not have been executed due to LTAD, which is 0.11% of all CHX trades in SPY during that time period. See Notice, supra note 1, at 65456.

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

[12] See Regulation NMS Adopting Release, supra note 4, at 37514. 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.

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.[13] This structural bias facilitates the ability of the latency arbitrageur to extract profits from symmetric information.[14] 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.[15]

LTAD is designed to offset this structural bias by giving liquidity providers "a tiny head start to the cancelation of stale quotes in the race to react to symmetric public information,"[16] without having a material impact on the ability of liquidity takers not engaged in latency arbitrage to access displayed liquidity at CHX. 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), LTAD is too short to have an incrementally negative impact on such non-latency arbitrage strategies. In other words, 350 microseconds is not long enough to permit a liquidity taker to act upon knowledge not already in its possession. Similarly, as described under the Appendix C analysis under the Notice,[17] LTAD is too short to have an incrementally negative impact on liquidity takers not engaged in latency arbitrage, such as retail investors. To the contrary, LTAD will benefit retail investors by encouraging liquidity providers to "post larger displayed orders at better prices on CHX with confidence that their orders will not be 'picked off' by speed arbitrageurs."[18] Thus, when a liquidity taker is acting on better or different information or otherwise submitting liquidity taking orders that are not part of a latency arbitrage strategy, such as retail orders, the resting liquidity will almost always remain available after LTAD. For these reasons, as well as other reasons discussed in greater detail below, the Exchange believes that LTAD is narrowly-tailored to address latency arbitrage.

LTAD is a direct response to latency arbitrage strategies that have diminished displayed liquidity and price discovery in the SPDR S&P 500 trust exchange-traded fund ("SPY") at CHX and beyond.[19] The Exchange believes that 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 away markets, whereby liquidity providers utilize, among other things, proprietary algorithms to price

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13 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 Letter") at 2.

14 See id.

15 See Regulation NMS Adopting Release, supra note 4, at 37514.

16 Budish Letter, supra note 13, at 2.

17 See supra note 10.

18 Letter to Elizabeth M. Murphy, Secretary, SEC, from Douglas A. Cifu, Chief Executive Officer, Virtu Financial at 2 (September 21, 2016) ("Virtu Letter").

19 See Notice, id., at 65443.

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) ("SPY Provide Activity"). During the period of January through July 2016, the Exchange observed unusual messaging patterns in SPY where executions of large inbound Immediate Or Cancel orders ("IOC"s) against resting orders in SPY were frequently followed by the receipt of late cancel messages for the provide order soon after the execution ("Too Late to Cancel" or "TLTC").[20] These observations were corroborated by feedback from CHX Participants, who indicated that, unlike prior to January 2016, they were no longer able to reliably cancel or cancel/adjust resting orders on the CHX book in SPY in response to market changes. The Exchange concluded that each instance of the unusual messaging pattern was the result of a successful execution of latency arbitrage ("SPY Latency Arbitrage Activity"), whereby a race to CHX was triggered by some away market event (i.e., symmetric information), and which resulted in the latency arbitrageur taking an order resting on the CHX book at a stale price before the liquidity provider was able to adjust the resting order. Consequently, as shown under the CHX ETF Anaylsis under the Notice, SPY Latency Arbitrage Activity dramatically reduced displayed liquidity in SPY at CHX and materially impacted displayed liquidity in SPY market-wide,[21] which is counter to the objectives of Regulation NMS.[22]

As applied to the SPY Latency Arbitrage Activity, LTAD will give CHX Participants engaged in SPY Provide Activity a tiny head start to adjust their orders before CHX Participants engaged in SPY Latency Arbitrage Activity reacting to the same market event could take such orders at stale prices. LTAD will not have an incrementally negative impact on the ability of liquidity takers not engaged in SPY Latency Arbitrage Activity to access displayed liquidity in SPY. Thus, the Exchange believes that LTAD will permit CHX liquidity providers to resume posting large and aggressively priced orders at CHX in SPY[23] and also encourage liquidity provision in all securities traded at CHX.

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20 The Exchange did not begin maintaining TLTC data until May 2016. See Notice, supra note 1, at 65456.

21 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 market-wide. 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. Also, the Time-weighted Average CHX Size At The NBBO in SPY relative to the total NMS Size At The NBBO in SPY as a percentage of the total NMS Size At The NBBO in SPY decreased from 44.36% in January 2016 to 3.39% in July 2016, while the Control Securities did not experience similar declines. See Notice, supra note 1, at 65448 – 65452. Moreover, while market-wide displayed liquidity in SPY remained relatively constant, if not slightly increased, from April 2016 through July 2016, displayed liquidity in SPY could have been 32.7% higher in July 2016 but for the SPY Latency Arbitrage Activity. See Notice, supra note 1, at 65452.

22 See Regulation NMS Adopting Release, supra note 4, at 37514. The Commission further stated in the Regulation NMS Adopting Release that "because of the enormous volume of trading in NMS stocks, even a small percentage improvement in depth and liquidity could lead to very significant dollar benefits for investors in the form of reduced transaction costs." Id. at 37512.

23 See supra note 21.

In its comment letter, HRT states that "what [CHX] describes as latency arbitrage [in the Notice] could be another firm or firms engaging in a similar strategy between CHX and the futures markets that are simply faster and/or more skilled than CHX's liquidity provider(s)."[24] To the contrary, while SPY Latency Arbitrage Activity and SPY Provide Activity are triggered by the same away market event, SPY Latency Arbitrage Activity is a distinct and harmful strategy that in no way resembles the SPY Provide Activity. In support, the Exchange submits the following additional data regarding SPY for the period of May through July 2016:

- SPY Latency Arbitrage Activity resulted in no liquidity in SPY at CHX as all orders attributed to SPY Latency Arbitrage Activity were IOCs.

- 77% of the trades attributed to SPY Latency Arbitrage Activity were followed by TLTCs from the provider.

- 2.7% of the trades not attributed to SPY Latency Arbitrage Activity were followed by late cancel messages from the liquidity provider.

Moreover, HRT claims that "when CHX's preferred market participants engage in the activity of updating prices of SPY due to changes in the price of S&P 500 futures using sophisticated pricing algorithms, it is generally beneficial, whereas when another market participant does the same thing, it 'diminishes displayed liquidity and impairs price discovery.'"[25] As described above, these disparate strategies are not the same. SPY Provide Activity resulted in substantial amounts of aggressively-priced SPY liquidity being provided to the market, whereas SPY Latency Arbitrage Activity provided no liquidity to the market and discouraged liquidity provision in SPY. While we agree with HRT that variances in skill or speed among market participants is a "general property of the natural world,"[26] we do not believe that such competition is productive when it is detrimental to the investor and the public interest, such as when speed advantages serve to diminish liquidity provision and frustrate the goals of Regulation NMS.[27]

In addition, in its comment letter, Citadel claims that SPY Latency Arbitrage Activity does not represent a market failure as it only impacted CHX in one security for which it had "only 5.73%" market share in January 2016[.]"[28] In response, the Exchange submits that the CHX ETF Analysis found under the Notice clearly shows the opposite.[29] The Exchange further submits that its 5.73% CHX market share in SPY in January 2016 was material when

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24 See HRT Letter, supra note 6, at 2.

25 Id.

26 Id.

27 See Regulation NMS Adopting Release, supra note 4, at 37514.

28 See Citadel Letter, supra note 7, at 1-2.

29 See supra note 21.

considering that 11 national securities exchanges were trading SPY in January 2016.[30] Moreover, as described above, latency arbitrage is a market-wide failure because it is built into the national market system and could impact liquidity provision in all securities and on all markets.[31] In the second quarter of 2016, the Exchange observed similar latency arbitrage activity in other S&P 500 correlated securities.

Accordingly, the Exchange submits that latency arbitrage is a market-wide problem and contrary to a fundamental principal of trading, that the parties agree upon the terms of the trade. Furthermore, minimizing the effectiveness of latency arbitrage can have a profoundly positive impact on displayed liquidity and price discovery at CHX and beyond.[32]

III. LTAD is not Unfairly Discriminatory

Section 6(b)(5) of the Act provides, in pertinent part, that the rules of an exchange must not be "designed to permit unfair discrimination between customers, issuers, brokers, or dealers."[33] Consistent with this requirement, LTAD will be applied to all liquidity taking orders submitted by all CHX Participants and thus does not unfairly discriminate among CHX Participants. While LTAD would delay all liquidity taking orders, including orders submitted by retail investors, as described above and in the Appendix C analysis under the Notice,[34] the 350-microsecond delay would be so short as to not have an incrementally negative impact on those liquidity takers not engaged in latency arbitrage activity, including retail investors.[35] To the contrary, LTAD will benefit retail investors by enhancing displayed liquidity and price discovery, as discussed below. As such, the examples set forth in the Citadel Letter purporting to illustrate the negative impact of LTAD on retail investor orders are pure conjecture.

Notwithstanding, in its comment letter, Citadel claims that LTAD "unfairly discriminates against market participants that are primarily liquidity takers, such as retail investors[.]"[36] HRT made similar statements in its comment letter.[37] These assertions are misguided. As described above, LTAD is long enough to neutralize microsecond speed advantages utilized by latency arbitrageurs, but too short to provide any incremental advantage to liquidity providers to react to information not already in their possession. Thus, LTAD will not have a materially negative impact on the ability of liquidity takers not engaged in latency arbitrage, such as retail investors,

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30 New York Stock Exchange ("NYSE") only trades Tape A securities. SPY is a Tape B security listed on NYSE ARCA.

31 See Budish Letter, supra note 13, at 2.

32 See Elaine Wah and Michael Wellman, "Latency Arbitrage, Market Fragmentation, and Efficiency: A Two-Market Model." 14th ACM Conference on Electronic Commerce (June 2013).

33 15 U.S.C. 78f(b)(5).

34 See supra note 10.

35 See Notice, supra note 1, at 65456.

36 Citadel Letter, supra note 7, at 3.

37 See HRT Letter, supra note 6, at 2-3.

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 LTAD.

The Exchange submits that, regardless of whether a delay is symmetric (e.g., IEX Delay) or asymmetric (e.g., LTAD), any intentional delay must discriminate between liquidity providing and liquidity taking orders in order to address latency arbitrage. That is, while the IEX Delay delays all incoming orders, the IEX Delay is asymmetric in that it provides processing advantages to non-displayed pegged orders resting on the IEX book over all other orders, including all liquidity taking orders. LTAD would similarly address latency arbitrage by giving all liquidity providing orders a processing advantage over all liquidity taking orders which, as described above, is necessary to offset a market structure bias currently exploited by latency arbitrageurs.

In addition, the Exchange notes that the Commission has previously approved functionality that permissibly discriminates between liquidity providers and liquidity takers for the purpose enhancing displayed liquidity. Specifically, the Commission has 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.[38]

- **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 enhance market liquidity for investors."[39] BATS Options offers a similar functionality, but permits all BATS Options users to utilize its bulk-quoting interface.[40] 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.

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38 See e.g., Bats BYX Fee Schedule; see also Section E.1 of the CHX Fee Schedule.

39 See Securities Exchange Act Release No. 65024 (August 3, 2011), 76 FR 48925 (August 9, 2011) (SR-NASDAQ-2011-102).

40 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).

Accordingly, given that the Commission found that the IEX Delay does not unfairly discriminate among its members[41] and has previously approved other mechanisms designed to promote displayed liquidity by permissibly discriminating between liquidity providers and liquidity takers, the Exchange requests that the Commission find that LTAD does not unfairly discriminate among CHX Participants.

IV. LTAD will Protect Investors and the Public Interest and does not Introduce Incremental Risk of Manipulative Acts or Practices

Section 6(b)(5) of the Act provides, in pertinent part, that the rules of an exchange must be designed "in general, to protect investors and the public interest."[42] As described above, the Exchange believes that LTAD will protect investors and the public interest by encouraging liquidity providers to post large and aggressively priced displayed liquidity at CHX,[43] which will enhance displayed liquidity available to all investors without limiting their ability to access liquidity.[44]

Generally, the Citadel and HRT Letters are replete with conjecture regarding the alleged market harm that would result if LTAD were approved and implemented. For example, while the Exchange agrees that "efficient functioning of the ETF market is predicated on the ability of ETF market makers to hedge in the underlying securities," Citadel has no basis to conclude that LTAD would negatively impact the ability of market makers to reliably hedge positions and has provided no market data or analysis to support the assertion.[45] To the contrary, CHX has provided market data and analysis that suggests that LTAD will not have a material impact on liquidity taking orders that are not submitted as part of a latency arbitrage strategy.[46]

In addition, Citadel claims that LTAD "fails to protect market participants that primarily act as liquidity takers, such as retail investor" and that LTAD "does not protect the general public, but is instead designed to benefit a select group of highly sophisticated market participants[.]" To the contrary, as described above and supported by the Appendix C analysis under the Notice,[47] LTAD will enhance displayed liquidity and price discovery 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 LTAD. Moreover,

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41 The Commission found that "IEX's ability to update the prices of resting pegged orders during the POP/coil delay is not designed to unfairly discriminate among members to the detriment of investors of the public interest and is intended to benefit investors that post pegged orders." See IEX Approval Order, supra note 3, at 41157 (emphasis added).

42 15 U.S.C. 78f(b)(5).

43 See supra note 18.

44 See supra note 21.

45 See Citadel Letter, supra note 7, at 7.

46 See supra note 10.

47 Id.

while LTAD is long enough to neutralize microsecond speed advantages utilized by latency arbitrageurs, it is too short to provide any actionable incremental advantage to liquidity providers in reacting to information not already it their possession. LTAD 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.[48]

In support of its assertion that LTAD "may be susceptible to manipulative acts and practices," Citadel presents a scenario in which a market participant submits an aggressive quote on CHX to influence the execution price of a midpoint pegged order on another market to its favor and, within 350 microseconds, cancel the CHX Quote.[49] Initially, the Exchange notes that it has surveillances in place to detect, and rules to prosecute, "spoofing" activity.[50] In addition, the Exchange submits that such a strategy is extremely unlikely to be executed successfully in a 350-microsecond window, as noted by the Commission.[51] Finally, the Exchange imposes an Order Cancellation Fee[52] for certain "wide" quotes, which include quotes that are cancelled within 10 milliseconds of their posting on the CHX book, the purpose of which is to dissuade order senders from submitting "flickering quotes," such as the one described in the example. Based on these factors, the Exchange submits that the Citadel example is unpersuasive.

Citadel also suggests that LTAD will encourage liquidity providers to submit non-bona fide quotes in order to earn additional MDR rebates pursuant to the CHX MDR Rebates Program and cites to CHX's cancel-to-trade and trade-to-order ratios in SPY as evidence of non-bona fide quoting activity by CHX Participants for the purpose of earning MDR Rebates.[53] Others commenters have made similar allegations.[54] These statements are, at best, misleading and uninformed.

Pursuant to the CHX MDR Rebates Program, the Exchange currently shares MDR received by the Exchange from the Securities Information Processors ("SIPs") with CHX Participants in proportion to their Eligible Quote Activity and Eligible Trade Activity per tape.[55] In attributing Eligible Quote Activity to CHX Participants, the Exchange utilizes a set of calculations

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48 Securities Exchange Act Release No. 78102 (June 17, 2016), 81 FR 40785 at n. 70 (June 23, 2016) ("Final Interpretation").

49 See Citadel Letter, supra note 7, at 9.

50 See CHX Article 9, Rule 11 (Price Manipulation).

51 See supra note 48.

52 See Section E.8 of the CHX Fee Schedule.

53 See Citadel Letter, supra note 7, at 9.

54 See Letter to Brent J. Fields, Secretary, SEC, from Joanna Mallers, Secretary, FIA Principal Traders Group at 3-4 (October 13, 2016) ("FIA Letter").

55 See Section P of the CHX Fee Schedule.

similar to those used by the SIPs in allocating MDR to the Exchange.[56] Notably, the Exchange will only credit quotes that remain on the CHX book for at least one second at the National Best Bid or Offer towards MDR rebates.[57] Thus, LTAD will not encourage non-bona fide quote activity as quotes cancelled within the 350-microsecond LTAD will not be eligible for MDR Rebates and the cancellation of such quotes could even result in the CHX Participant being assessed an Order Cancellation Fee.

Moreover, the unique cancel-to-trade and trade-to-order ratios in SPY at CHX are consistent with the SPY Provide Activity. As discussed above, the Exchange believes that much of the CHX liquidity in SPY and other S&P 500-correlated securities is provided as part of an arbitrage strategy that requires constant tracking of index market data from a derivatives market. Since each change in the correlated index market data from a derivatives market could necessitate a corresponding adjustment to the SPY quote at CHX, it logically flows that adjustments rates for SPY at CHX would be higher than at other markets, as the Exchange believes that this type of liquidity provision is unique to CHX.[58]

Accordingly, the Exchange submits that LTAD will protect investors and the public interest and does not introduce incremental risk of manipulative acts of practices.

V. LTAD is Consistent with the Firm Quote Rule

Rule 602(b)(2) provides as follows:

> 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.[59]

A plain reading of Rule 602(b) indicates that the delay of a liquidity taking order pursuant to LTAD would not result in the order being "presented" to the liquidity provider. This is consistent with the Commission's guidance regarding the applicability of the Firm Quote Rule in the context

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56 See Exchange Act Release No. 70546 (September 27, 2013), 78 FR 61413 (October 3, 2013) (SR-CHX-2013-18); see e.g., Section 5, Exhibit 1 of the UTP Plan, http://www.utpplan.com/utp_plan.

57 On October 17, 2016, the average time that a quote in SPY that earned quote credits remained on the CHX book was 3.785 seconds and the median time was 2.270 seconds.

58 Aside from CHX, no other equities exchange maintains primary matching engines in Chicago.

59 17 CFR 242.602(b)(2) (emphasis added).

of obsolete Intermarket Trading System ("ITS") commitments.[60] 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."[61] 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."[62] 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.[63] When also considering that the Exchange will never notify liquidity providers or the public of the Exchange's receipt of a liquidity taking order subject to LTAD[64] and CHX Rules indicate that a liquidity provider's Rule 602(b) obligation vests only after execution of its order within the CHX Matching System,[65] the Exchange submits that LTAD is consistent with the Firm Quote Rule.

Notwithstanding, various commenters have claimed that LTAD is inconsistent with the Firm Quote Rule.[66] For example, in its comment letter, Citadel states that LTAD is a "last look

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60 See Exchange Act Release No. 40260, 63 FR 40748, 40754 (July 30, 1998).

61 Id (emphasis added).

62 Id (emphasis added).

63 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 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.

64 The Exchange will never disseminate information regarding delayed liquidity taking orders. See Citadel Letter, supra note 7, n. 25.

65 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.

66 See e.g., Citadel Letter, supra note 7, at 3; see also e.g., HRT Letter, supra note 6, at 3; see also e.g., Letter to Brent J. Fields, Secretary, SEC, from Elizabeth K. King, General Counsel and Corporate Secretary, NYSE at 2-3 (October 14, 2016) ("NYSE Letter"); see also e.g., Letter to Brent J. Fields, Secretary, SEC, from Eric Swanson, EVP, General Counsel and Secretary, Bats Global Markets, Inc. ("Bats") at 1-2 (October 25, 2016) ("Bats Letter").

mechanism" [67]and "would undermine the Firm Quote Rule by allowing a liquidity provider to back away from its displayed quotation before a liquidity taking order could execute that quotation."[68] These arguments are misplaced.

While Rule 602(b) clearly prohibits a liquidity provider from being afforded a "last look" and "backing away" from its displayed quotations, LTAD is absolutely not a "last look mechanism" and most certainly does not permit a CHX Participant to "back away" from a quote. "Last look mechanisms" necessarily require that the liquidity provider have knowledge of the marketable contra-side order and have the ability to explicitly reject pending trades,[69] such as certain functionalities used in foreign currency trading.[70] To the contrary, LTAD will never result in the liquidity provider being notified of a pending match or being given the option to reject a pending trade and thus LTAD will never permit a liquidity provider to "back away." Moreover, because the Exchange will never notify a liquidity provider that LTAD had delayed a marketable contra-side order, such knowledge cannot be imputed to the liquidity provider.

Accordingly, the Exchange submits that LTAD is consistent with the Firm Quote Rule.

VI. LTAD is a De Minimis Intentional Delay and is Consistent with the Order Protection Rule

Rule 600(b)(3) of Regulation NMS 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. In the context of determining whether a trading center maintains an "automated quotation" for purposes of the Order Protection Rule, 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).[71] 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.[72]

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67 Citadel Letter, supra note 7, at 2.

68 Id. at 5.

69 See supra note 63.

70 Compare e.g., http://www.barx.com/last-look-disclosure.html, accessed October 20, 2016.

71 See Final Interpretation, supra note 48, 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."

72 See Final Interpretation, supra note 48, at 40792.

The Exchange believes that LTAD is so short as to not frustrate the purposes of the Order Protection Rule by impairing fair and efficient access to the Exchange's quotations for the following reasons:

- LTAD will apply to all liquidity taking orders submitted by any CHX Participant and will only delay such orders by 350 microseconds, the same length as the IEX Delay. Thus, all CHX Participants seeking to take liquidity from the CHX book will have fair and efficient access to CHX quotations.

- Moreover, the 350-microsecond delay is so short that it does not provide an incremental advantage to a liquidity provider other than neutralizing a structural bias that permits latency arbitrageurs to profit off of symmetric public information.[73] To the extent a market participant has a better algorithm or better information, LTAD is too short to have a negative impact on such non-latency arbitrage strategies, much less permit a liquidity provider to "decide on a quotation-by-quotation basis whether to cancel or modify a quote."[74]

- LTAD is narrowly-tailored to minimize the effectiveness of latency arbitrage strategies at CHX, as supported by the Appendix C analysis under the Notice that shows that LTAD would have an immaterial impact on liquidity taking orders not submitted as part of a latency arbitrage strategy, such as retail orders.[75]

In its commenter letter, Citadel states that "[LTAD] is plainly not de minimis, as its intended purpose is to specifically frustrate the ability of liquidity takers to access CHX quotations."[76] This is incorrect. As described above, while LTAD will be applied to all liquidity taking orders, it will only have a material impact on those liquidity taking orders submitted as part of a latency arbitrage strategy. As such, it will only frustrate the ability of latency arbitrageurs to take stale quotes, which the Exchange submits is permissible in light of the harmful effects of latency arbitrage on liquidity provision, as discussed above.

VII. Responses to Other Concerns

Under the Notice, the Exchange described "variable message queuing delay" and "system messaging delay" to illustrate the delays inherent to the operation of the CHX Matching System. Specifically, the Exchange defined "variable message queuing delay" as the length of time it takes for a message to be evaluated and/or processed by the Matching System after initial receipt and "system-processing delay" as the length of time it takes for a message to be evaluated and/or processed by the CHX Matching System.[77]

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73 See Budish Letter, supra note 13, at 2.

74 See Citadel Letter, supra note 7, at 10.

75 See supra note 10.

76 See Citadel Letter, supra note 7, at 12.

77 See Notice, supra note 1, at n. 28,

Some commenters have expressed concerns about the "system messaging delays" and "variable message queuing."[78] For example, the Leuchtkafer Letter suggests that such processing delays are unique to software-implemented intentional delays and urges the Commission to "reject speed bumps implemented in software because of the indeterminacies inherent in software-imposed speed bumps."[79] In response, the Exchange submits that such delays and queuing already exist today in every market that utilizes a continuous limit order book to rank and match orders, including those markets that implement an intentional delay via hardware, such as IEX, and other markets that utilize cross-connect cables of an equal length to ensure equal latency for its members.[80] Because such delays and queuing are a function of finite network and processing resources, and consequently exist in every market, the Exchange does not believe they are relevant to the present question.

VIII. Conclusion

As Chair White noted in 2014, "[a] key question is whether trading venues have sufficient opportunity and flexibility to innovate successfully with initiatives that seek to deemphasize speed as a key to trading success in order to further serve the interests of investors. If not, we must reconsider the SEC rules and market practices that stand in the way."[81] The Exchange believes that LTAD is precisely such an initiative and that SEC rules are designed to permit such flexibility, as demonstrated by the Commission's approval of IEX's Form 1 application,[82] the Exchange's Sub-second Non-displayed Auction Process ("SNAP") functionality,[83] and the other initiatives described above that are designed to enhance displayed liquidity.[84]

In light of the importance of data and empirically based decision-making to the Commission[85], the Exchange included an unprecedented level of market data analysis in its proposed rule change to adopt LTAD. However, in the event the Commission believes that additional data is necessary to better understand the impact of LTAD on the markets, the

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78 See Citadel Letter, supra note 7, at 12-13; see also Letter to Brent J. Fields, Secretary, SEC, from R.T. Leuchtkafer at 1 (September 29, 2016) ("Leuchtkafer Letter").

79 See Leuchtkafter Letter, supra note 7, at 1.

80 See Letter to Brent J. Fields, Secretary, SEC, from Sophia Lee, General Counsel, IEX at 3 (November 13, 2015).

81 See Mary Jo White, Chair, Securities and Exchange Commission, Speech at Sandler O'Neil & Partners L.P. Global Exchange and Brokerage Conference (June 5, 2014).

82 See supra note 3.

83 See Securities Exchange Act Release No. 77711 (April 26, 2016), 81 FR 26295 (May 2, 2016) (SR-CHX-2016-01); see also Securities Exchange Act Release No. 76087 October 6, 2015, 80 FR 61540 (October 13, 2015) (SR-CHX-2015-03); see also http://www.chx.com/snap/market-activity/aoo.html, accessed October 25, 2016.

84 See supra notes 39 and 40.

85 See supra note 81.

Exchange is amenable to implementing LTAD on a pilot basis in all securities traded on CHX[86] and to collect data that is informative to the Commission and the public. The Exchange is committed to transparency and welcome an opportunity to cooperate with the Commission and other market participants in furtherance of the protection of investors and the public interest. With that said, the Exchange strongly submits that it has already provided sufficient market data and analysis regarding the need for and the potential impact of LTAD.

Accordingly, the Exchange respectfully requests that the Commission approve the Exchange's proposed rule change to implement LTAD as submitted.

Sincerely,

James Ongena
Executive Vice President and General Counsel

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[86] In the event LTAD is implemented as a pilot, the Exchange believes that LTAD should be applied to all securities traded on CHX so as to avoid scenarios where one security traded on CHX is subject to LTAD, but a correlated security also traded on CHX is not subject to LTAD. This concern was noted by a commenter regarding improprieties that may result if LTAD were not applied to all correlated securities trading on an exchange. See Leuchtkafer Letter, supra note 79, at 1-2.