FINRA

Financial Industry Regulatory Authority

18 August 2011

Werner Bijkerk
International Organization of Securities Commissions
Calle Oquendo 12
28006 Madrid
Spain

Re: Public Comments on Consultation Report by the Technical Committee of the International Organization of Securities Commissions (IOSCO), Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency, July 2011

Dear Mr. Bijkerk:

The Financial Industry Regulatory Authority (FINRA) welcomes the opportunity to comment on certain aspects of the July 2011 Consultation Report that relate to our market oversight experience in the U.S. By way of introduction, FINRA is the largest self-regulatory organization (SRO) in North America and is subject to direct oversight by the U.S. Securities and Exchange Commission (SEC). FINRA provides regulatory services to 14 equities and options markets operated by nine U.S. national securities exchanges. Specifically, FINRA provides regulatory services to the five U.S. equities and options markets operated by NYSE-Euronext and the six U.S. equities and options markets operated by NASDAQ OMX. FINRA's surveillance now covers approximately 80% of the trading volume of the U.S. equities markets and 35% of the options markets.

FINRA is also responsible, by statute, for surveillance of trading of the U.S. over-the-counter (OTC) markets for corporate equities and bonds. This segment includes alternative trading systems (ATSs), both dark and lit, operated by registered broker-dealers subject to FINRA's jurisdiction. ATSs compete for order flow in several thousand listed equities classified as National Market System (NMS) securities under the U.S. regulatory framework.

Accordingly, FINRA has a strong interest in the impact of technology on trading venues and trading practices across the diverse markets for which it conducts electronic surveillance and investigates instances of potential market abuse. Given the nature of our regulatory experience, we focus our remarks on two areas identified in the July 2011 Consultation Report: (1) **Question 6**—suggested

improvements in market regulators' surveillance capabilities in light of the dramatic growth of computerized trading in equities markets, and (2) **Questions 3 and 13**—what pre- and post-trade measures should be introduced that relate to the use of and risks posed by trading algorithms and whether market operators should be required to provide testing environments to enable participants to stress-test new/modified trading algorithms.

As we make clear below, our recommendations advance a number of IOSCO principles on the regulation of secondary trading markets, including (1) requiring that the establishment of exchanges and trading systems be subject to authorization and oversight; (2) detecting and deterring market manipulation and other unfair trading practices; and (3) reducing systemic risks.

In reference to Question 6, FINRA recommends that regulators develop a consolidated audit trail file—encompassing transactions, quotations and the full life cycle of orders. This holistic approach requires unified data content and format requirements applicable to all market participants and venues that trade a defined group of securities. If implemented, the consolidated audit trail will enable systematic detection and documentation of various trading abuses even if they consist of multiple orders/trades across several market venues.

In reference to Questions 3 and 13, FINRA supports the concept of stress testing trading algorithms in a test environment before they go into live production. Among other things, such testing would enable market participants to better assess whether the algorithms are potentially abusive or whether they have a programming flaw, such as self-referencing their own quotes in a manner that creates a "looping" effect that generates excessive and disruptive quote volume. Given these obvious benefits, FINRA believes that pre-launch testing should be encouraged by regulators as part of a firm's risk management program. Responsibility for the adequacy of the testing and its cost properly lies with the firm that wants to introduce the new trading system/tool. As for providing an acceptable test environment, FINRA understands that this function might be offered by a market operator or possibly a software vendor with the requisite skills and market data. The possibility of competing providers should not be foreclosed by regulation.

I. Background and Context of the July 2011 Consultation Report

This Consultation Report originated with a mandate from November 2010 G20 Seoul Summit to launch an action plan to achieve strong, sustainable, and balanced economic growth. To support that mandate, the G20 requested that

IOSCO produce a "...report to the Financial Stability Board (FSB) [on] recommendations to promote markets' integrity and efficiency to mitigate the risks posed to the financial system by the latest technological developments."

In part, the G20 mandate coincided with work already undertaken by IOSCO's Technical Committee that yielded a July 2010 report, *Objectives and Principles of Securities Regulation* (July 2010 Report), which recommended specific principles for regulators to ensure the integrity of secondary securities markets.

That work was followed by an August 2010 report, *Principles for Direct Electronic Access to Markets* (the August 2010 Report). The August 2010 Report offered several recommendations to guide regulators' efforts to mitigate direct access risks by requiring certain control mechanisms such as mandatory pre-trade filters to reject potentially erroneous or manipulative orders, implementing appropriate position and/or credit limits on individual traders, and understanding the trading strategies used by clients seeking to receive direct electronic access.

In May 2011, IOSCO published a third report grounded on the G20 mandate, *Principles for Dark Liquidity,* which sought to address market efficiency concerns related to pre-trade transparency, as various regulators had identified a pattern of dark venues attracting increasing volumes of retail-size orders, thereby detracting from price discovery in lit markets that cater to retail investors.

Most recently, the current July 2011 Consultation takes a broader perspective in assessing the impact of technology-driven trading and market structures, reviewing whether new regulations, market structure changes, redefinition of market-making obligations for high frequency traders, or new types of pre- and post-trade controls are needed to maintain the integrity of secondary equity markets and their capacity to deliver efficient price formation in a transparent manner. To focus this consultation, IOSCO has offered the following definitions: (1) *Market integrity* is the extent to which a market operates in a manner that is, and is perceived to be, fair and orderly and where effective rules are in place and enforced by regulators so that confidence and participation in the market is fostered; and (2) *Market efficiency* refers to the ability of market participants to transact business easily and at a price that reflects all available market information. Factors such as liquidity, price discovery, and transparency are key elements in determining whether a market is efficient.

FINRA's comments, set forth below, focus primarily on the maintenance of market integrity and the regulatory infrastructure needed to achieve that objective in an environment characterized by fragmented liquidity across several trading venues

and the use of highly automated trading programs and strategies that increasingly account for larger trade and share volumes (estimated to be as high as 60% in U.S. equity markets).

II. The Consolidated Audit Trail and Market Integrity

The July 2011 Consultation Report details the different market structures, trading strategies, and competitive outcomes that have evolved from technological advancements in the marketplace. In FINRA's view, the fundamental principles of market integrity and investor protection remain critical to achieve markets that function fairly and efficiently, regardless of the level of automation used in trading. Anti-fraud and anti-manipulation rules still constitute the legal cornerstones of market integrity, and the challenge for regulators is to adapt oversight techniques to keep pace with evolving market structures and trading practices. The objective is to deter market abuse by effective surveillance and enforcement, thereby bolstering investors' confidence in the fairness and efficiency of the markets and reinforcing the significant role of secondary markets in the capital formation process.

Based on FINRA's experience in regulating markets in the U.S., we recommend the development of a consolidated audit trail for transactions, quotations and orders in all covered equity securities. This data must be captured in electronic form, according to unified standards for content and formatting, across all of the competing venues and participating broker-dealers that trade the covered securities. Moreover, the data/formatting standards must be memorialized in rules and specifications that can be enforced by means of electronic monitoring techniques that flag incomplete or erroneous inputs requiring correction by the originating parties. After collection and validation, the audit trail data can serve as the foundation upon which regulators can conduct automated surveillance to generate alerts of order, quotation or transaction events that are indicative of market abuse. The alerts must then be investigated to determine if a violation actually occurred and if so, enforcement action must be initiated.

In sum, FINRA recommends that regulators take a holistic approach to the design of an effective market surveillance infrastructure that: (1) specifically recognizes the possibilities for prohibited trading practices across multiple venues; (2) permits systematic tracking of individual market participants responsible for those patterns; and (3) utilizes highly reliable transaction, quotation, and order audit trail data to detect and reconstruct abusive trading scenarios to support successful enforcement cases against responsible parties.

A. Challenges in Developing an Effective Consolidated Audit Trail

The developmental steps of transaction and order audit trails across the U.S. equities markets have followed different evolutionary paths over many years. In large part, this traces back to the legal framework under the Securities Exchange Act of 1934 (1934 Act), which envisioned each national securities exchange as the front-line SRO responsible for surveillance of its market place, and one or more national securities associations carrying out the corresponding function for the OTC equities market. The Securities Acts Amendments of 1975 (and the implementing regulations under the 1934 Act) led to dramatic changes in market structure to achieve the policy objective of greater inter-market competition for investors' orders. These reforms included the concept of a national market system with appropriate electronic linkages among the competing markets, the creation of a consolidated transaction tape and a consolidated quotation system to enhance price discovery and facilitate best execution of investors' orders in NMS securities.

Over time, the trade-by-trade information captured for the consolidated transaction tape was expanded to include additional data elements that are collected strictly for regulatory purposes and not disseminated to the public. These elements are captured in the transaction audit trail file for all NMS securities (regardless of execution venue), along with the price and volume information disseminated real-time via the consolidated tape.

Regarding development of an order audit trail for NMS securities, the respective SROs responsible for surveillance of the exchanges and the OTC market used different systems to capture and analyze order data, and different techniques to integrate order and transactional data for regulatory purposes. Even today, development of a true consolidated order trail for transactions and orders in NMS securities requires further work to achieve 100% coverage in a single, integrated data file. With the expansion of FINRA's market surveillance responsibilities to the largest U.S. equities exchanges and certain other electronic markets, momentum continues to build for the establishment of a fully consolidated order and transaction audit trails for NMS securities and related derivatives.

Most recently, the design and content of a national consolidated audit trail has drawn significant attention from the SEC and its Congressional oversight panels in the wake of the May 2010 Flash Crash. Among other actions, the SEC has responded by issuing a rule proposal for public comment that would, for the first time, articulate the specifications for a comprehensive consolidated audit trail for

NMS securities, encompassing orders and transactions.[1] The SEC continues to deliberate on its proposal in light of numerous comment letters.

Nonetheless, for purposes of the July 2011 Consultation, FINRA believes that it would be most useful to share some experiences and insights on the content of the existing order and transaction audit trails. Because audit trail information underpins development of a comprehensive electronic surveillance regime for NMS securities (as well as for comparable equity securities traded in secondary markets globally), we believe it useful to share FINRA's views on key aspects of a consolidated audit trail customized to today's technology driven markets.

1. Consistent time stamps

FINRA's experience in developing its Order Audit Trail System (OATS) has demonstrated that certain data elements are critical to effective cross-market surveillance.[2] FINRA recommends that a consolidated order audit trail be viewed as an essential complement to a consolidated transaction audit trail. Essentially, the two must be highly reliable and capable of being linked to allow a review of all trading in a given security over a specified time period. The integration of the two audit trails is also important for market reconstruction to prove trading violations.

Therefore, in addition to a framework that requires market participants to report the same data elements in a standardized format, it is equally important that each reporting party follow a common timekeeping standard when affixing event time stamps in an order's life cycle, down to the millisecond where feasible. Given that virtually all market participants employ electronic order management systems, it is imperative that these systems' internal clocks be synchronized to the maximum extent possible through constant recalibration to an established time standard. In

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[1] *See* Securities Exchange Act Release No. 62174 (May 26, 2010), 75 FR 32556 (June 8, 2010) (File No. S7-11-10). *See,* letter from Marcia E. Asquith, Senior Vice President and Corporate Secretary, FINRA, to Elizabeth M. Murphy, Secretary, Securities and Exchange Commission (SEC), dated August 9, 2010, which conveyed the FINRA staff's comments on the Consolidated Audit Trail proposal. *See also,* letter from Marcia E, Asquith, Senior Vice President and Corporate Secretary, FINRA, and Janet M. Kissane, Senior Vice President and Corporate Secretary, NYSE Euronext, to Elizabeth M. Murphy, Secretary, SEC, dated August 9, 2010, conveying the collective comments of the staffs of FINRA and NYSE Euronext on the Consolidated Audit Trail proposal.

[2] OATS is a separate system developed and operated by FINRA to capture full audit trail details for orders in unlisted and NASDAQ-listed securities. The data elements and operational standards required by OATS are specified in FINRA's Rules. Any member firm that accepts an order in a covered security must report the required data according to those specifications. For example, data requirements mandate that order events include a time stamp of order receipt and acceptance by the firm, time of transmission for execution, and time of execution or cancellation. Hence, the utility of OATS data requires accurate time stamps. In the second half of 2011, FINRA will extend OATS to all orders in NYSE-listed equities, replacing the NYSE's order tracking system. Information on the OATS rules can be found at: http://www.finra.org/Industry/Compliance/MarketTransparency/OATS/.

this way, the consolidated order audit trail will capture properly-sequenced information to enable recognition and reconstruction of order patterns indicative of market abuse (e.g., wash sales, front-running of a market moving client order, or rapid entry and cancellation of orders to manipulate a market's opening or closing auctions for individual securities). Without highly accurate time stamps, the surveillance system will either miss violations or generate too many false positives.

2. Adapting to order handling practices

A significant challenge for FINRA in operating OATS is to ensure that its reporting structure keeps pace with evolving order handling practices among broker-dealers. FINRA has found that a significant number of orders in today's marketplace are not handled on a one-for-one basis, i.e., with a single routing decision to a single venue for possible execution. Instead, firms may use separate systems to manage order collection and obtain the required executions. Additionally, batch processing and order splitting can occur in both pre-trade and post-trade processes. Firms may receive multiple orders and combine them for order handling purposes, or split large orders into multiple orders and route them to multiple execution venues. Our experience has shown that a single order can be both split and batched during its lifecycle.

FINRA has responded to these scenarios by adjusting the OATS technical requirements to permit capture of such scenarios to the extent possible, taking into account FINRA's jurisdiction over reporting firms. Clearly, this evolution requires a constructive dialog between senior staff of the affected broker-dealers and FINRA, as well as their respective technical staffs. Based on this experience, we believe that the feasibility of a consolidated order audit trail necessitates an industry-wide set of specifications to produce useful regulatory inputs and a single consolidator of the collected data. Going forward, it is also necessary to recognize changes in order management practices (which could be driven by new software tools or risk management techniques) and their potential impacts on the specifications for the order audit trail system.

3. Granularity of the Audit Trail

Presently, audit trails for U.S. equity securities capture the parties originating the buy and sell sides of each trade down to the level of the executing broker-dealer. This might be adequate in the case of a proprietary orders and trades, but not for certain client-originated orders. A more granular audit trail that captures the identification of specific market participants would enable regulators to more readily detect abusive trading, while at the same time avoiding the generation of

false positive surveillance alerts. However, FINRA also believes it is important for regulators to weigh the benefits that a more granular audit trail can provide against the usefulness of such data and the operational complexities necessary to capture the data. Accordingly, as an initial matter, based on its experience with U.S. equity markets, FINRA believes the following types of market participants should be specifically identified in a consolidated audit trail: (1) market participants that have sponsored or direct access to market centers via a relationship with a sponsoring market participant; and (2) market participants whose trading activity falls within the definition of a "large trader" under applicable regulations.[3] To prevent market participants from "reverse engineering" the identification of a large trader or its trading strategies, FINRA also believes steps should be taken to construct audit trails to minimize the flow of unique identifiers across market participants through, among other means, the development of relationship tables that only regulators can access.

With respect to registered broker-dealers, the audit trail data includes a market participant identifier or MPID to distinguish the firms. This identifier is captured for each side of a completed trade. However, there is no requirement or convention that each firm use the same MPID in every venue where it trades. A given firm also may use different MPIDs to reflect different trading desks. Finally, the availability of direct electronic access arrangements permits broker-dealer A to transact for its own account by using the MPID of broker-dealer B, who is sponsoring A's access. FINRA recommends that these anomalies be corrected with unified standards for identifiers for broker-dealers, in order to avoid concealment of potential trading abuse, whether perpetrated in a single market or across multiple markets. We believe it appropriate to consider a unified standard for MPIDs in the equities-based derivatives markets as well.

4. Reliance on audit trail data in complex enforcement cases

The availability of key audit trail information cannot be underestimated in its use in enforcing market integrity requirements. Indeed, on September 13, 2010, FINRA issued a news release announcing the conclusion of an enforcement action that resulted in sanctions totaling $2.26 million against Trillium Brokerage Services, LLC ("Trillium"), the firm's Director of Trading, Chief Compliance Officer, and nine proprietary traders. The illicit trading practice detected in this case involved the placement of limit orders at the inside market on one side of the market, followed by the placement of numerous layered, non-bona-fide market-moving

[3] On July 27, 2011, the SEC approved a set of rules that impose a reporting requirement on market participants that fall within the definition of a large trader. The rules are scheduled to go into effect on October 3, 2011. See Securities Exchange Act Release No. 64976.

orders on the opposite side of the market, generally in substantial size relative to the stock's legitimate pending order volume. By so doing, the traders created a false appearance of buy- or sell-side pressure in the subject securities. FINRA found that this strategy induced other market participants to enter orders to execute against the limit orders previously entered by the Trillium traders. After their offers were filled, these traders would immediately cancel the non-bona-fide orders that had been entered to create a false appearance of market activity in the subject security. As a result of this high frequency trading strategy, Trillium's traders obtained advantageous prices that otherwise would not have been available to them on 46,000 occasions, thus producing trading profits of approximately $575,000.

Without timely and highly accurate order and transaction audit trail information, it would have been extremely difficult, if not impossible, for FINRA (or any other regulatory authority) to reconstruct order and transaction activity to support a successful enforcement action. We reference this case to illustrate the critical link between a consolidated audit trail and regulatory action needed to safeguard market integrity in response to a manipulative, high frequency trading strategy.[4]

III. Mandating Stress and Provision of Test Environments

Questions 3 and 13 of July 2011 Consultation Report raise issues concerning risks to the stability of markets that might stem from inadequate testing of proprietary algorithms or trading system changes before launching them into a production or live environment.[5] This discussion illustrates how a systemic risk can be transmitted when (a) insufficient testing leads to aberrant market prices on one venue, and (b) those prices ripple into other venues that trade the same security (or a derivative of that security). Examples of algorithms that malfunctioned and caused further deterioration to orderly markets are well documented in the SEC-CFTC study of the May 6, 2010 Flash Crash. In this regard, the Consultation Report also referenced an earlier enforcement action by NYSE Regulation grounded on a member firm's failure to test a modified trading algorithm to validate its proper operation before moving it to a production environment. [6]

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[4] FINRA notes that the use of a consolidated audit trail to detect and prosecute abusive HFT trading strategies also is responsive to Question 10, which asks how regulators could address such strategies.

[5] *See* Chapter 3, Sec. 5(c), at 29.

[6] Further details can be found at: http://www.nyse.com/DiscAxn/discAxn_01_2010.html.

Separately, the possibility of regulatory action to mandate stress testing of market systems and software to ensure orderly markets was raised in a recent speech by the SEC Chairman.[7] Her remarks focused the issue of technology risk and how that risk should be mitigated in light of the Flash Crash experience. Specifically, she suggested the possibility of converting the SEC's automation review policies ("ARP") to binding rules.[8] The ARP sets forth the SEC's expectations for regular capacity and system stress testing by market operators and market participants. ARP also speaks to covered parties using an appropriate testing protocol, which should be documented, before the rollout of a major system enhancement. Thus, a central objective of the ARP is to minimize the likelihood of systemic risk being triggered by insufficient testing before a technology enhancement is rolled out.

In light of the Flash Crash experiences and the increasing dominance of equities trading by persons using high frequency strategies, FINRA recommends that regulators consider, in the first instance, recommending the performance of stress testing prior to the launch of new (or substantially modified) proprietary trading systems and related software, including trading algorithms. What would constitute adequate pre-launch testing would likely vary depending on the nature or complexity of the technological change being made. Consequently, FINRA recommends that regulators encourage firms to conduct pre-launch testing as an important link to effective risk management. Additionally, FINRA believes that the cost of pre-launch testing should be borne by the firm that has decided to introduce the new trading system/software tool and use it across the available trading venues.[9]

From the perspective of the market operators, it appears that they need to cooperate in conjunction with a firm's stress testing, at least by providing access to historical market data to drive test scripts. However, it is unclear whether market operators should be considered the sole providers of acceptable test environments. Indeed, other entities may be capable of supporting adequate testing environments along with advising firms on the design and benchmarking of the

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[7] *See* Speech by SEC Chairman Mary L. Schapiro, to the SIFMA Compliance and Legal Society Annual Seminar, March 23, 2011.

[8] The ARP originated as one remedial response to the October 1987 market crash, which had exposed system capacity and operational weakness during a period of abnormally high trading volumes.

[9] This approach also would complement a new rule concerning direct market access recently implemented by the SEC, SEC Rule 15c3-3 promulgated under the 1934 Act. See Securities Exchange Act Release No. 63241 (November 3, 2011), 75 FR 69792-69826 (November 15, 2010).

tests. Accordingly, FINRA would suggest that any regulatory action taken in this area allow for flexibility in how firms can satisfy the stress testing requirement.

IV. Conclusion

FINRA's experience in developing market surveillance techniques to adapt to evolving market developments strongly supports the notion of building a consolidated audit trail system to support market integrity. Taking a holistic approach and standardizing data inputs across the competing venues are essential to detect novel forms of market abuse in today's environment. It is equally important to develop the market reconstruction capability needed for successful enforcement actions against parties who employ trading algorithms to manipulate market prices or order volumes for illicit gains (or loss avoidance). To the extent that systems/facilities already exist to support a consolidated transaction tape and/or to capture key order details, it is worthwhile to consider building on those technical foundations to achieve a national (or regional) consolidated audit trail file.

In light of the Flash Crash experience and the tremendous growth in customized software to drive high frequency trading models across many venues, FINRA recommends that there be a requirement for market participants to stress test trading algorithms and related software prior to launch. The requirement should apply at the level of the intermediary that seeks to introduce these tools. The stress testing would complement, but not replace, ongoing risk controls over the computerized systems that the firm maintains to conduct its day-to-day business.

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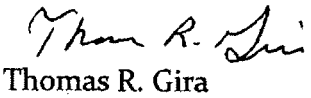
Finally, we wish to acknowledge the breadth of research and thoughtful analysis reflected in the July 2011 Consultation. FINRA appreciates the opportunity to comment on this Consultation and, if there are any questions concerning our comments, please feel to contact me at tom.gira@finra.org or +1 240 386 5026.

Sincerely,



Thomas R. Gira
Executive Vice President
Market Regulation Department