CITADEL

October 1, 2012

Via Electronic Submission: http://www.sec.gov/rules/submitcomments.htm

The Honorable Mary L. Schapiro
Chairman
Securities and Exchange Commission
100 F Street NE
Washington, DC 20549–1090

Re: Technology & Trading Roundtable (Comment File No. 4-652)

Dear Chairman Schapiro:

Citadel LLC[1] ("Citadel") appreciates this opportunity in advance of the Securities and Exchange Commission (the "Commission") roundtable on "*Technology and Trading: Promoting Stability in Today's Markets*"[2] (the "Roundtable") to offer recommendations designed to improve market stability and enhance market integrity in today's increasingly automated trading environment.[3]

The introduction of computerized trading systems has markedly improved conditions for investors, who now benefit from dramatically lower trading costs, improved market transparency and liquidity, and increased market competition. Because technological innovation will continue to drive growth and efficiencies in our markets, we must not only embrace this transformation, but also modernize our regulatory framework to recognize and address new challenges presented by automation.

Before widespread computerized trading, markets were notoriously opaque and errors and control breakdowns were the norm. In that environment, intermediaries captured profits that were many multiples of what is available today. Participants in manual markets, including Citadel, would routinely encounter workflow control issues, trade breaks, and delays in receiving fills and trade confirmations. Although some choose to reminisce fondly about the past, the reality was much different. The costs of such issues were enormous and investors paid the price.

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[1] Established in 1990, Citadel is a leading global financial institution that provides asset management and capital markets services. With over 1,100 employees globally, Citadel serves a diversified client base through its offices in the world's major financial centers including Chicago, New York, London, Hong Kong, San Francisco and Boston. Citadel Securities operates an industry leading market making franchise and an institutional markets platform. On an average day, Citadel accounts for over 13 percent of U.S. listed equity volume and over 20 percent of U.S. listed equity option volume.

[2] See notice of Roundtable at http://www.sec.gov/rules/other/2012/34-67802.pdf

[3] Citadel participated in the development of the recommendations of the Industry Working Group of self-regulatory organizations (SROs) broker-dealers, and buy-side firms referenced in the SROs' letter to the Commission dated September 28, 2012.

While computerized trading has raised new challenges, it is undisputed that today's markets are more competitive and liquid – with lower overall transaction costs – than ever before.

Thus, the challenge for the industry today is to advance risk controls to match improvements in market quality. The benefits of automation aside, if trading systems operate without effective controls, they can cause unintended damage if they malfunction. All market participants, exchanges, and other market centers must have effective controls to protect themselves, their clients, and the markets against the malfunction of their systems.

Successfully meeting these challenges will depend on three key elements.

First, regulators must avoid the temptation to require inflexible supervisory review paradigms. While such paradigms are straightforward for non-technology experts to design, review, and critique with 20/20 hindsight, they do not advance the goal of improving the performance of complex automated trading systems.

Second, exchanges must play a critical gatekeeper role. The majority of listed equity transactions occur on a handful of exchanges, and exchanges are in the strongest position to efficiently prevent trading system malfunctions from disrupting the market.

Third, regulators, policy makers, and market participants must not lose sight of the simple truth that experienced personnel with clearly defined authority, responsibility, and accountability are just as, if not more, important to the safe and sound operation of trading systems as automated controls and technology processes. Simply put, even in highly automated markets, people are critical.

We thank the Commission and Staff for organizing the Roundtable and engaging in constructive dialogue with the industry on how best to ensure the continued stability and prosperity of the U.S. capital markets.

I.   Recommendations for Regulators

Regulators should continue to improve discipline by defining and enforcing minimum frameworks for effective trading system controls at the exchange and participant level. Effective controls will help reduce the likelihood of market-destabilizing system malfunctions, and regulators are in the best position to prevent a race-to-the-bottom where companies with lax controls, or who choose not to invest in controls, are at a competitive advantage over those market participants that have effective controls.

Nonetheless, we caution against adopting recommendations based on an overly simplistic "one size fits all" perspective. Trading systems are necessarily complex and malfunctions are inherent in complex automated systems. Therefore, markets will be best protected by multiple, effectively designed layers of protections that reduce the frequency and impact of malfunctions.

Regulators should focus on deliverables rather than overly prescriptive supervisory review paradigms.[4] Simply adding requirements for more and more supervisory paper trails will impose substantial costs and do little to protect markets. Instead, effective regulation should be based on a clearly articulated framework of minimum standards for effective trading system controls, as detailed further below.

II.   Recommendations for Exchanges

Exchanges, like other market centers, must play an important gatekeeper role by having effective controls to minimize the impact of a member's trading system malfunction on other members and the markets as a whole.[5] Because exchanges sit at the center of trading, they are best positioned to monitor activity across a very large number of market participants. Such safeguards are not a replacement for the controls that each member firm must implement, but rather are a necessary back-stop to limit the damage from problems that overcome member firm controls.

Exchanges must have clear authority and responsibility to block and stop activity that appears erroneous and likely to materially impact members or the market. In furtherance of this goal, exchanges should employ robust and reliable systems that automatically identify potentially erroneous activity (for example, by member, mnemonic, symbol, and/or session). Flagged activity could, for example, trigger one or more of an escalating series of actions such as:

1. Automatic notifications to the member responsible for the activity;

2. Review by exchange staff who could contact the member and/or decide to block further activity;

3. Automatic blocks of further activity; and/or

4. Under appropriate circumstances, sending a confidential notification to other exchanges and ATSs indicating that a firm's trading is halted.

If halted, the activity in question could be resumed only if the relevant member confirms to the exchange (electronically or otherwise) that the activity is not erroneous, the relevant member confirms that the cause of such activity has been corrected, and/or exchange staff confirm after further inquiry that the activity does not appear to be erroneous.

Exchanges should provide drop copies of executions back to market participants independent of the direct order path. This allows market participants to have independent feeds for their risk management systems, to detect quickly any anomalies between internal trading

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[4] For example, requiring a software release to be approved as fit for production by an experienced professional involved in the design and development is better than requiring that a given release type A must go through tests X, Y, and Z.

[5] Other market centers already have these obligations under SEC Rule 15c3-5.

records and exchange records, and to have a back up source of position and risk data if the direct order path is compromised.

Exchanges should also significantly enhance their test environments and procedures to reduce the risk of errant code being introduced by the exchange or a market participant. This would include:

1. Providing a more robust test environment that closely mirrors a number of production days of activity and making such environments available during normal business hours. Allowing a software release to interact with as close to real market conditions as possible will catch errors that an individual market participant's testing may miss.

2. Changes to exchange software should go through a controlled, limited release with backward compatibility to allow members to stage the release of their software at a significantly reduced risk level.

3. Exchanges should require members to perform testing and certify compliance with the exchange's test requirements before the release of a *major* suite of new functionality by the exchange.

Finally, exchanges should implement common control practices currently in place on the listed options exchanges including:

1. Risk controls to prevent rapid fire errant orders based upon the number of trades per symbol per side within a pre-defined time window.

    a. The exchange should set levels on these controls such that they operate at two levels: a preventive "speed bump" level where a market participant could reset the tolerance programmatically; and a mandatory level that would require an affirmative conversation between the exchange and the market participant to reset the tolerance.

    b. These activity risk controls for each market participant should take into account the nature of the market participant (e.g. market maker) and the normal and peak volumes for such a market participant.

2. Exchanges should provide an independent direct connection or web interface in addition to the normal phone line to allow a market participant to quickly cancel open market orders and/or trigger a kill switch in the event of an issue that cannot otherwise be readily stopped by the market participant.

Exchanges should also work together or through DTCC to establish maximum exposure levels based on a market participant's capital and business. Given the limited number of exchanges relative to market participants, establishing controls at the exchange level will be more efficient and provide a more robust market-wide safeguard.

III.   Recommendations for Market Participants

Market participants, including investors, market intermediaries and market centers, must take responsibility for their automated trading systems and ensure that they have effective controls in place. The software development lifecycle should include robust development, testing, and release processes, coupled with effective protocols and processes for monitoring and controlling the operation of automated trading systems once they are released in production.[6] Market participants should take a vested interest in making these processes effective and not simply endeavor to comply with the minimum standards established by regulations.

Market participants should perform tests against the exchanges' test environments and roll out changes that interface with the exchanges in a controlled fashion. Market participants are best equipped to develop and perform their own testing as they have intimate knowledge of the changes being released and the impact on their software. Nonetheless, even with careful testing, issues may still arise given the innumerable interactions and iterations that will be experienced in a dynamic live-market environment affected by, among other things, the software deployed by others, the sequencing of events (roll outs and otherwise) and the variations of flows and volumes.

Market participants must thus maintain systems and processes for monitoring and controlling the operation of automated trading systems (like those required by SEC Rule 15c3-5).[7] Market participants should build appropriate monitoring tools (for example, live monitors and exception reports), including a monitoring system separate from the trading system that allows a firm to independently monitor risk should its primary trading system or connection to the exchange fail.

Market participants should also have appropriate automated and manual control mechanisms, including those that block or limit activity that appears to be erroneous, or otherwise undesirable. Automated control mechanisms, however, should also be implemented carefully and conservatively because they too can cause severe problems if they function in a manner not anticipated or intended.

Finally, management oversight is also critically important. In our view, the impact of management decisions often gets overlooked as a contributing factor to trading system problems. Decisions made by key personnel play an important role in the outcome and impact of most major trading system issues. No amount of testing, kill switches, or other automated controls can

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[6] There are a number of recommended best practices in these areas, such as those recommended by the FIA Principal Traders Group and FIA European Principal Traders Association in their *Software Development and Change Management Recommendations*, published in March 2012 and available at http://www.futuresindustry.org/downloads/Software_Change_Management.pdf.

[7] While SEC Rule 15c3-5 requires broker-dealers to implement reasonable controls to protect against erroneous orders, and credit exposure and capital risks faced by broker-dealers accessing the markets, this rule does not apply to other market participants and markets other than securities markets.

overcome a lack of skilled and experienced personnel with clear authority, responsibility, and accountability for trading system operation.

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In conclusion, we believe that regulators, exchanges, and other market participants all have a critical role to play in improving market stability and enhancing market integrity in the automated trading environment. Markets will be best protected by multiple, effectively designed layers of protections that reduce both the impact and frequency of malfunctions. While robust processes for software development, testing and releases, coupled with effective monitoring, controls and safeguards, are core to limiting system malfunctions, the importance of management oversight should not be overlooked as both the first and last defense against trading system problems.

We appreciate the opportunity to provide these recommendations to the Commission. While regulators and the industry have much work ahead to achieve the goals described in this letter, we are confident that automated trading will continue to accrue benefits for generations to come.

Please feel free to call the undersigned at (646) 403-8200 with any questions regarding our recommendations.

Respectfully,

/s/ Jamil Nazarali
Head of Citadel Execution Services

CC: The Hon. Elisse B. Walter, Commissioner, SEC
       The Hon. Luis A. Aguilar, Commissioner, SEC
       The Hon. Troy A. Paredes, Commissioner, SEC
       The Hon. Daniel M. Gallagher, Commissioner, SEC
       Robert W. Cook, Director, Division of Trading and Markets, SEC