CME Group

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Re: Public Comment on Consultation Report: Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency

CME Group Inc. ("CME Group") appreciates the opportunity to comment on the International Organization of Securities Commissions' ("IOSCO") Consultation Report: Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency (the "Report").

CME Group is one of the world's largest and most diverse derivatives marketplaces. We operate four separate exchanges, including the Chicago Mercantile Exchange Inc. ("CME"), the Board of Trade of the City of Chicago, Inc. ("CBOT"), the New York Mercantile Exchange, Inc. ("NYMEX") and the Commodity Exchange, Inc. ("COMEX"). The CME Group exchanges offer the widest range of benchmark products available across all major asset classes, including futures and options based on interest rates, equity indexes, foreign exchange, energy, metals, agricultural commodities and alternative investment products. As a pioneer in the globalization of the futures markets, CME Group has also helped to expand the customer base for futures products. To satisfy the increasing demands of the international marketplace, our CME Globex platform is accessible more than 23 hours a day by customers in more than 150 countries and foreign territories around the world. Telecommunications hubs in Singapore, London, Amsterdam, Milan, Paris, Seoul, São Paolo, Kuala Lumpur and Mexico City reduce our customers' connectivity costs, increase accessibility, and deliver faster, more efficient trading. Additionally, CME Group has established international offices in London, Singapore, Tokyo, Hong Kong, São Paolo and Calgary. CME Group believes that its significant global expertise and experience will provide IOSCO with a unique and valuable perspective on the matters discussed herein.

CME Group is strongly supportive of the efforts to promote the integrity, efficiency and transparency of global financial markets and appreciates the importance of ensuring that risk management and regulatory frameworks keep pace with the rapid technological advancements that have characterized the evolution of markets in recent years. That technological change has been the catalyst for the development of more competitive, more efficient and more transparent markets, as well as substantial improvements and innovation in risk management and regulatory capabilities.

The Report focuses broadly on the impact of the growth in algorithmic and high frequency trading, the risks associated with the deployment of automated trading systems, and the supervision and regulation of trading in a more complex, interconnected and higher speed environment.

With respect to CME Group markets, high frequency traders and other algorithmic traders play an important role in the diverse mix of market participants who trade CME Group products. Algorithmic and high frequency traders have evolved in response to the transition to electronic trading and the corresponding advancements in technology that created opportunities to optimize trade execution in terms of quality, speed and operational efficiency. Given these drivers, the volume attributable to such trading is likely to continue to increase.

There is considerable evidence, some of which is cited in the Report, that these traders provide important benefits to the market in that they contribute to increased liquidity and narrower spreads, thereby enhancing market quality for all participants by reducing their transaction costs. Algorithmic trading also allows traders to improve their speed of execution, reduce the market impact of large orders and process more data more quickly to improve execution quality and consistency. High frequency traders additionally enhance price discovery and market efficiency by trading away temporary market inefficiencies more quickly.

In our view, algorithmic and high frequency traders are simply traders who employ specialized tools, albeit from a very diverse toolkit. Tools with appropriate safety features significantly diminish the potential for harm, and automated trading clearly demands appropriate risk management functionality by traders, clearing firms and market centers, as well as effective rules, to mitigate risks to market integrity and stability. As discussed further in this response, there have been material advancements in these areas as market structures and technology have evolved, reflecting the industry's strong collective interest in fair, well-regulated and orderly markets. If these risk and regulatory frameworks are sensibly and responsibly applied, and if continued innovation is not forestalled by overly prescriptive regulation, the demonstrated benefits of algorithmic and high frequency trading will continue to contribute to the liquidity, efficiency and growth of global financial markets, while simultaneously strengthening market integrity, stability and investor confidence.

The Report poses a number of questions which we respond to below.

Q1 What impact have the technological developments in the markets in recent years had on your own trading? Has it encouraged, discouraged or had no impact on your willingness to participate on the lit markets, and how does this differ between asset classes and/or instruments?

At CME Group, algorithmic and high frequency trading are products of the evolution of markets from a floor-based model to an electronic model.[1] In CME Group's electronic market model, price and book data is disseminated in real-time to all participants simultaneously, trading in the central limit order book is fast, competitive and fully transparent, and cross-product spreading and cross-market arbitrage are easily facilitated. Given this market model and the corresponding advancements in technology, it is not at all surprising that traders have increasingly turned to automation to optimize trade execution, increase operational efficiency and enhance risk management. As a result, algorithmic and high frequency trading has grown, contributing to significant volume growth across all asset classes and providing greater liquidity and tighter bid/ask spreads. The liquidity generated by these traders is, in turn, relied upon by all types of market participants to achieve their risk management and investment objectives and allows them to do so at lower cost. The considerable growth in volume and open interest that has occurred on CME Group's centralized market as electronic trading has evolved reflects that the technological developments in financial markets have led to broadly increased participation in the markets.

Algorithmic trading techniques are presently widely used not only by sell-side market participants, but also increasingly by buy-side (institutional) participants to manage their order execution processes to enhance the quality of their executions. These users employ a wide variety of increasingly sophisticated algorithms to systematically place orders to achieve desired execution benchmarks such as a volume weighted average price or time weighted average price, relying on intelligent analytics to optimize trade execution while also achieving operational efficiencies.

It is also important to recognize that algorithmic traders, like non-automated traders, engage in varied activities such as market-making, arbitrage and hedging and employ diverse strategies in each of these contexts to achieve their objectives. A significant proportion of high frequency traders active on CME Group markets contribute substantial liquidity by providing continuous markets in our products and that liquidity, in turn, often supports enhanced liquidity on other market venues trading related products. Other high frequency traders engage in various forms of inter-market arbitrage, promoting efficient trading by improving the linkages among related instruments across asset classes. Algorithmic and high frequency traders take market risk and have exposure to market movements notwithstanding the fact that their holding periods may be short in duration. They employ multi-factor models in order to forecast "micro-price" movements

[1] We note that there are no precise definitions to describe the diverse trading strategies encompassed by the terms algorithmic or high frequency trading. For purposes of this letter, we refer to algorithmic trading generally to mean the use of any automated order execution methodology. High frequency trading is best understood as a subset of algorithmic trading that is characterized by high levels of messaging deployed in a very low latency infrastructure as well as high turnover with short holding periods.

and identify market inefficiencies, and their participation thus not only contributes to liquidity, but also to very efficient and transparent price discovery.

High frequency traders have been maligned by some who assert that their presence is disruptive to markets. CME Group does not believe that assertion is supported by the evidence, and, in fact, numerous academic studies have broadly concluded that high frequency traders are significant contributors of liquidity and help to mitigate market volatility. Liquidity is clearly the most effective defense against disorderly markets and given the substantial liquidity provided by high frequency traders, it would be counterproductive for regulators to promote regulation that impairs their participation and compromises market efficiency and stability.

The Report makes numerous references to the *Flash Crash* of May 6, 2010, and states in its conclusion that the usage of HFT "was clearly a contributing factor" to the flash crash event. CME Group did not find that to be the case in its review of the activity on its markets and the joint report of the Commodity Futures Trading Commission ("CFTC") and the Securities and Exchange Commission concluded that HFT activity was not the cause of the flash crash. In fact, our analysis concluded that HFT traders were significant liquidity providers in a period of tremendous liquidity demand. What the analysis of the activity of that date did reveal, however, was that the degree to which different markets functioned effectively was impacted by the presence or absence of effective risk management tools, volatility mitigation mechanisms and transparent trade cancellation policies. There inevitably will be occurrences of liquidity imbalances in markets, as well as liquidity crises on rare occasions – that is simply the nature of markets and in today's high speed market environment, liquidity is extraordinarily dynamic and can be consumed, withdrawn and supplied very rapidly. Automated trading is not the problem, but it is imperative that market structures, risk controls and regulatory frameworks are fully adapted to this environment to promote the integrity and stability of markets.

Q2 What are your views on the suggestion that proprietary trading firms (including HFT firms) that are not currently subject to registration/authorisation by a regulator should be required to obtain such a registration/authorisation? Are there specific regulatory requirements you believe such firms should face?

CME Group does not believe that imposing specific regulatory registration requirements based solely on the type of trading strategy employed by a particular firm is appropriate. At CME Group, these customers are subject to the rules of the exchange, and all such clients with direct market access must explicitly consent to the jurisdiction of exchanges on which they operate.

We believe that the best approach to mitigating the types of risks that arise from automated trading is to ensure effective risk management and supervisory programs are in place at every level of the supply chain, that is, at the trading firm, clearing firm and the exchange levels, thereby substantially reducing the likelihood that a single point of failure will threaten the integrity or stability of the market. CME Group supports adopting principles-based rules that require effective supervision and risk management programs, consistent with the nature of the business being conducted. Effective programs should feature robust pre- and post-trade risk management protocols and supervisory procedures that are reasonably designed to control access, effectively monitor trading, and prevent errors as well as other inappropriate activity that

poses a material risk of causing a significant market disruption. In the case of trading firms, these controls commonly include, for example, credit, position and loss limits, order size restrictions, price sanity checks and automated execution throttles, all of which serve to mitigate the potential for disruptive activity. As the markets have evolved, the sophistication of these risk management capabilities has evolved as well. Additionally, it is important to recognize that such principles are equally important in the context of manually entered orders which are equally capable of causing market disruptions in an electronic trading environment.

CME Group rules require all clearing members to have written risk management policies and procedures in place that are commensurate with the firm's size, clientele and product mix, and CME Group's Clearing House Risk Management Group conducts regular risk reviews of clearing members to assess compliance with these standards. Given the breadth of risk profiles across the spectrum of clients, it would be inappropriate for exchanges or federal regulators to mandate "one-size-fits-all" risk management parameters when the firm is much better positioned, given its relationship to the client and its knowledge of the client's trading, to determine the specific parameters of appropriate risk management. Clearing firms, who must financially guarantee the trading activity of their clients, also have strong incentives to manage their clients' risk exposures and routinely have numerous automated pre-trade and post-trade risk controls built into the proprietary or vendor-provided order entry systems they offer.

CME Group provides firms with a number of tools to assist them in managing risk, including, for example, its Drop Copy Risk Management Service and FirmSoft Order Management Tool. CME Group's Drop Copy service allows customers to receive, via a FIX messaging interface, real-time copies of Globex execution reports, acknowledgement and reject messages. This enables firms to feed the data to their internal risk systems and monitor trading activity and risk on a real time basis. The Drop Copy service also allows for the monitoring of aggregate activity guaranteed by one or more clearing firms upon approval of the clearing firms. FirmSoft is a browser-based order management tool which provides real-time access to information on working and filled Globex orders, as well as order modification history. Access to FirmSoft can be granted at various levels such as at the trader or account level. FirmSoft also allows users to cancel an individual order, a group of orders or all working orders and mass quotes, thereby providing important risk mitigation functionality at all times including during system failures.

CME Group also believes that exchanges have an important role to play in protecting the integrity and orderliness of their markets and have strong incentives to mitigate the potential for market disruptions. Beyond the granular pre-trade and post-trade risk controls firms employ at the account/trader level to reduce the potential for disruptive trading, CME Group employs a variety of risk management and volatility mitigation functionalities on its Globex platform that apply to all orders entered into its electronic markets. For example, CME Group's price banding, maximum order quantities, market and stop order protection points, stop logic functionality, firm-level credit controls, messaging controls, cancel-on disconnect functionality and market maker sweep protections all serve to substantially reduce the likelihood and/or impact of disruptive trading. (A number of these mechanisms are discussed in more detail below.) The specific parameters of each of these risk management tools are carefully considered and are routinely evaluated by exchange personnel who have the expertise necessary to establish parameters that effectively protect market integrity without

inappropriately interfering in the efficient and reliable functioning of the market. Of course, while an exchange implements such functionality in the context of protecting broader market vulnerabilities to disruptive trading, this functionality cannot replace the more granular risk management controls that firms should have in place and execute at the client level.

As noted above, CME Group cautions against adopting overly prescriptive and inflexible "one-size fits all" regulation. Such regulation tends to be inappropriately targeted, ineffective and have unintended adverse consequences given the variability of participant and market circumstances. Prescriptive rules also often become quickly outdated in areas where markets and technology rapidly evolve, and there is little room for continuing innovation within the confines of inflexible and highly rules-based systems. Given the exceptional breadth of automated trading systems and strategies and the dynamic evolution of markets and technology, any effort to promulgate prescriptive rules in this regard is therefore likely to be counterproductive.

To what extent do your answers differ if the proprietary trading firm accesses the market as the customer of an intermediary firm through DEA (i.e. under that intermediary's trading rules/codes) rather than as a direct member of the market itself?

CME Group supports allowing exchange clearing members to provide direct market access to their customers, provided that the clearing member has appropriately vetted the client and implemented appropriate risk management controls, including mandatory pre-trade credit control functionality provided by the exchange, and the client has satisfied the system conformance testing requirements of the exchange. The U.S. futures industry has invested, and continues to invest, considerable time in developing best practices with respect to direct market access, and we encourage IOSCO to consider the body of work already completed, including the Futures Industry Association's "Market Access Risk Management Recommendations" and the Professional Traders Group's "Risk Controls for Trading Firms," published in April and November 2010, respectively.

Q3 What recommendations, if any, would you propose to strengthen the regulatory requirements around pre- and post-trade risk controls? In particular, what measures, if any, do you think regulators should introduce that relate specifically to the use of and risks posed by algorithmic trading and/or HFT?

As discussed above, CME Group believes that effective risk management protocols are necessary at the trading firm, clearing firm and exchange levels, and the regulatory requirements must support that goal. These different entities each have strong, independent pecuniary and reputational incentives to protect against market disruptions and, clearly, robust, multi-pronged risk management controls and supervisory procedures are critical elements in the collective effort to protect against such disruptions. This holistic approach offers the most robust protection to markets by engaging all levels of the supply chain in the commitment to preserving market integrity and eliminating the possibility that a single point of failure will cause significant harm to the market.

CME Group therefore encourages each jurisdiction to establish appropriately consistent, principles-based regulatory frameworks that effectively support the principles of sound supervisory and risk management protocols without creating unnecessarily onerous bureaucratic burdens or discouraging continued innovation. This is important, as at least from a U.S. futures-centric point of view, any analysis of the evolution of risk management in the electronic trading environment over the past five years would surely reveal, notwithstanding the considerable growth in messaging volumes and the increased speed of trading, tremendous progress in terms of risk management capabilities.

Trading firms and clearing firms should have principles-based supervisory obligations that include the establishment of documented internal control procedures, including appropriate testing before automated systems are deployed in the production environment, as well as the implementation of risk management controls that are appropriate to the entity's business and reasonably designed to protect against activity that could disrupt the market. Trading firms, for example, should be required to certify to their clearing firm the implementation of appropriate pre-trade controls such as order quantity limits, price sanity checks, messaging throttles and execution throttles, with the parameter ranges of these controls agreed to by the clearing firm.

Market centers obviously also have a critical role to play in this regard as they are the last line of defense before orders interact with the market, and they too should be subject to principles-based regulatory requirements that require robust conformance testing, clear trade adjustment or cancellation protocols and automated risk controls reasonably designed to protect the broader market from disruptive activity. As referenced above, in addition to certain automated pre-trade risk management and volatility mitigation controls, CME Group also requires all clearing firms to employ CME Globex Credit Control functionality. The credit control functionality provides automated pre-trade credit controls at the trading firm level without introducing additional order processing latency. The credit limits for each trading firm are established by the clearing firm, subject to review by the Clearing House, and the functionality provides for automated early warning notifications as well as automated real-time actions that prevent the limits from being breached.

With respect to whether regulators should attempt to promulgate rules that regulate the design of algorithmic or automated trading systems specifically, CME Group would argue that regulators are neither equipped to do so, nor would it be an efficient or effective use of regulatory resources to attempt to do so. Regulators should instead focus on regulating conduct that is shown to be harmful to the market and, as discussed above, consider promulgation of principles-based supervisory and internal control standards that include appropriate testing before automated systems are deployed in the production environment.

Q4 To what extent do you believe the use of trading control mechanisms such as circuit breakers and limit-up/limit-down systems by trading venues should be mandated? If you believe they should be mandated, should venue operators be permitted to design their own controls or should they be harmonised/coordinated across venues (including between interrelated instruments such as a derivative and its underlying)?

In our view, it is necessary to distinguish between large scale macro market events and single venue anomalies caused by transitory liquidity gaps or erroneous trades. The regulatory tools that best address the problem of damaging market-wide price swings are different from those that are best suited for issues that are isolated to a single instrument on a particular market.

In the equity market context, we believe fully coordinated and properly calibrated market-wide circuit breakers should be mandated to address those rare macro-market events that threaten the integrity of the market's trading and clearing infrastructures and severely challenge investor confidence. Today's financial markets feature many products that are intricately related and users of these related products frequently trade multiple asset classes using carefully coordinated strategies. This interconnectedness is why uncoordinated market halts have the potential to exacerbate rather than mitigate risk.

CME Group is not supportive of single security trading halts that meaningfully interrupt price discovery as we believe such halts actually serve to undermine rather than promote liquidity during broadly volatile periods. This can be illustrated by the example of imposing single stock trading halts, independent of market-wide circuit breakers, on ETFs that are based on equity indexes that also underlie other financial products including index futures, options on index futures, cash-index options and options on ETFs. The events of May 6, 2010 clearly revealed the important linkages between markets and the unhelpful impacts on liquidity supply and demand when those linkages cannot be relied upon by market participants or otherwise break down as the result of uncoordinated actions across comparable markets. Inconsistent treatment of the same beta exposure only serves to add stress to the market during periods of market turbulence.

Additionally, in a large scale market event where single stock trading halts apply, it is possible to have scenarios where multiple constituent stocks in an index are halted without a market-wide circuit breaker being triggered. In these circumstances, the individual stocks could be halted and opened on staggered timelines while the index ETFs, index futures and related options products continued to trade. This disconnect would obviously create complexity and confusion as it relates to understanding the index calculation and the true value of the index at any particular point in time. Market participants would be required to determine for themselves the relevance of the index values that are disseminated during the time period when various index-component stocks have been halted. The resulting inability to discover accurate prices and perform appropriate risk management would certainly impair liquidity provision in index-based products. This, in turn, would serve to compound the problem by making it more difficult for the halted stocks to replenish liquidity.

CME Group believes that transitory liquidity gaps occurring on a single market can be mitigated by simpler and less disruptive means. An isolated issue on a single market should not result in halting the trading of that security on all markets and thereby undermine the ability of market participants to manage their exposure while the broader market continues to trade. Rather, the best way to address single market anomalies is through market-by-market automated volatility mitigation and risk management functionalities. These simple mechanisms can help minimize the potential for transitory liquidity gaps or error trades to occur in the first instance and can be

implemented in ways that are designed to minimize the risk of causing collateral distress to markets and market participants. For example, markets can adopt:

(1) automated dynamic price banding that prevents the entry of erroneously priced orders;
(2) automated order quantity limits that prevent the entry of "fat finger" order quantities;
(3) automated market and stop order protection points that mitigate the impact of market or stop orders entered in illiquid conditions; and
(4) automated volatility mitigation functionality that *briefly* pauses or limits trading to allow liquidity to be sourced; in today's highly automated trading environments this pause can generally be calibrated in seconds.

All of the functionalities identified above are currently used by CME Group as described below:

Price Banding: CME Globex subjects orders to price verification upon entry using a process referred to as price banding. Price banding is designed to prevent the entry of orders at clearly erroneous prices, such as a bid at a limit price substantially above the market, thereby mitigating the potential for a market disruption. For each futures product, CME Group establishes a Price Band Variation parameter which is a static value that is symmetrically applied to the upside for bids and the downside for offers relative to a reference price. In the E-mini S&P 500 futures, for example, this parameter is currently set at 12 index points (approximately 1% of the current index value). The reference price, referred to as the Banding Start Price, is a dynamically calculated value based on market information such as last trade price, best bid and offer price or the indicative opening price. Orders entered at prices beyond the Price Band Variation parameter relative to the reference price are rejected by the Globex engine. Price banding functionality for options on futures is similar to futures price banding except that the Banding Start Price may reference theoretical option prices based on established option pricing models in addition to last trade price. Additionally the width of the option price bands may be either a static value for a particular option series or a dynamic value that adjusts based on the option's delta or a delta-adjusted percentage of the option's theoretical price.

Protection Points: CME Group employs functionality that applies a limit price (protection point) to each market order entered on the CME Globex platform and to each stop order entered without a limit price. This functionality prevents orders from being filled at significantly aberrant price levels because of the absence of sufficient liquidity to satisfy the order at the time the market order is entered or the stop order is triggered. The protection points for each product are generally defined as one half of the product's "Non-Reviewable Range," a value that is established in connection with the exchanges' Trade Cancellations and Price Adjustments rule. The protection point is measured from the best bid price for sell market orders, the best offer price for buy market orders, and the stop trigger price for stop orders. Any quantity on the order that is unfilled at the protection point level becomes a resting limit order at that price and creates the opportunity to source liquidity. In the E-mini S&P 500 futures contract, for example, this parameter is set at 3 index points (approximately ¼ of 1% of the current index value.)

Order Quantity Protections: Maximum order size protection is embedded Globex functionality that precludes the entry of an order into the trading engine if the order's quantity exceeds a pre-defined maximum quantity. Orders entered for a quantity greater than the prescribed maximum quantity are rejected by the Globex engine. This functionality helps to avoid market disruptions by preventing the entry of erroneous orders for quantities above the designated threshold. In the E-mini S&P 500 futures contract, this parameter is set at 2,000 contracts.

Stop Logic Functionality: CME Group's proprietary Stop Logic functionality serves to mitigate artificial and disruptive market spikes which can occur because of the continuous triggering, election and trading of stop orders in an illiquid market condition. On CME Globex, if elected stop orders would result in execution prices that exceed pre-defined thresholds, the market automatically enters a reserve period for a prescribed number of seconds; the length of the pause ranges from 5 to 20 seconds and varies based on the characteristics of the product and time of day at which the stop logic event is triggered. During the reserve period, new orders are accepted and an indicative price is published, but trades do not occur until the reserve period expires, thereby providing an opportunity for participants to respond to the demand for liquidity. If contra-side liquidity is not sourced during the initial reserve period, the price band will increase by another increment and a second iteration of the stop logic will commence. This process will continue until liquidity is sourced or for up to a maximum of twelve iterations. In the E-mini S&P futures, for example, the stop logic price parameter is 6 index points (approximately ½ of 1% of the current index value) and the time parameter is 5 seconds during regular trading hours and 10 seconds outside of regular trading hours.

Q5 To what extent do you believe market maker schemes offered by trading venues should be subject to mandatory minimum criteria? Should the criteria be determined by the trading venue alone? To what extent do you agree with the suggestion that the use of stub quotes should be prohibited?

As a general principle, CME Group does not believe that market makers should be *required* by third parties to put their own capital at risk when it is unprofitable to do so. Clearly, all trading firms should be expected to quote responsibly based upon their ability to manage the risks associated with the orders they place. It would be extremely irresponsible for a high frequency trader, or any other trader, to continue to operate an algorithm under conditions in which it was not designed to operate or when the inputs to the algorithm are not reliable. Doing so could potentially put the firm itself at risk and arguably subject the firm to regulatory exposure if their algorithm malfunctioned and created or exacerbated a disruption in the market.

In CME Group's view, the establishment of minimum quoting criteria should be a matter of an exchange's business judgment rather than regulatory mandate. Rules that would undermine a trading firm's own risk management processes by creating mandatory affirmative trading obligations in highly volatile periods are misguided. Assuming participants in fact complied with such obligations during a significant liquidity event, which they likely would not, this "cure" would simply lead to the depletion of market making capital and result in less liquid and more volatile markets. Parties engaged in multi-market arbitrage activities that cannot rely on timely, accurate data or on trade certainty in one or more of those markets, cannot reasonably be expected to continue to provide liquidity. Further, in order to mitigate the risk to capital and

reduce the potential for causing disruptions in the market, firms can be expected to have automated risk management protections built into their algorithmic code to prevent new orders from being entered or to liquidate outstanding positions if certain boundary conditions are identified that would potentially cause an algorithm to malfunction.

Markets that choose to establish minimum quoting criteria in exchange for specified incentives should prohibit stub quoting practices as such quotes serve no economic purpose and can result in executions at grossly erroneous prices which undermine the market's integrity.

CME Group believes that effectively calibrated market-wide circuit breakers, coupled with automated volatility mitigation and risk management mechanisms and certainty regarding trade cancellation policies, are straightforward steps that will be much more impactful than mandated affirmative quoting obligations in encouraging liquidity providers to remain in the market during highly volatile periods.

Q6 Do you have suggestions for improvements to regulators' surveillance capabilities with respect to the markets and modern trading techniques? Please elaborate.

One of the many benefits of electronic trading is the ability it affords regulators to capture audit trail data on a real-time basis at a very granular level. As technology in financial markets has rapidly evolved and market participants have increasingly relied upon automated trading systems, order and market data messaging have grown substantially, surpassing 5 billion messages per month on CME Group markets. CME Group's self-regulatory group anticipated this growth in messaging and designed systems infrastructure and applications to efficiently capture the full-range and contextual-support dimensions of all electronic activity, including all elements of order messages, transactions and market data quotations, each with time stamps calibrated to the millisecond. This highly granular data also includes identifying elements such as the executing firm, user ID and account number for each trade and whether the user is employing an automated trading system. Additionally, tools to efficiently mine and aggregate that data with exceptional speed are available to all regulatory analysts and allow for the querying of real-time and historical data. CME Group, as well as other U.S. futures exchanges and the CFTC, also have daily large trader reporting requirements which provide visibility into the outstanding positions of all traders with reportable positions. This type of comprehensive audit trail data, as well as robust technology infrastructures and tools, are essential if regulators are to perform their responsibilities effectively and efficiently in the highly data intensive markets that operate today.

Just as technology has been critical to advancements in trading and risk management, it has also been vital to advancements in regulatory surveillance capabilities, which like the trading have become increasingly sophisticated. At CME Group, the Market Regulation Department employs sophisticated systems to profile markets and participants, to review and analyze participants' order activity, trading and positions, generate live position and volume alerts based on absolute levels or on anomalous activity relative to historical profiles, and to identify transaction patterns and anomalies that may be indicative of misconduct. These systems are used to monitor the activity of algorithmic and high frequency traders, as well as all other market

participants. The systems contain detailed order and transaction data, quotation data, profile statistics of markets and market participants, analytical tools and a full suite of pattern detection capabilities, integrated with the market and participant profiles, that allow analysts to set variable parameters and establish differential priority rankings for specific pattern elements. This collection of data and regulatory systems provides analysts with tremendous flexibility in analyzing market activity, including the activity of algorithmic and high frequency traders, at the most granular level in order to identify activity that may be indicative of market misconduct or otherwise threaten the integrity of the markets.

Continuous market surveillance and administration is also performed by CME Group's Globex Control Center ("GCC") and Globex Support Administration ("GSA"). The GCC provides 24-hour electronic market operations and customer service support for all trading on CME Globex. In addition to its responsibilities for the administration of the markets, the GCC handles all inquiries and requests for assistance, provides order status information to registered contacts, administers the Trade Cancellation and Price Adjustment policy, oversees price banding and maximum order quantity parameters, and cancels working orders at the customer's direction in the event the customer is unable to do so. The GCC is also responsible for trading halt management in emergencies and the execution of circuit breaker and price limit procedures.

Dedicated GCC staff are also assigned to proactively monitor the markets on a real time basis, examining the origin and/or market impact of various anomalies such as volume or price spikes, stop logic events, unusual messaging, technical issues, and orders that are rejected by the engine for exceeding price banding or maximum order size parameters. The objective of this monitoring is to mitigate risks to the proper functioning of the market. The GCC refers potential regulatory issues to the regulatory team for investigation of potential rule violations.

The GSA provides 24-hour technical support for Globex and seeks to ensure optimal system performance by proactively measuring client messaging activity and its impact on components of the electronic trading infrastructure. GSA staff investigate and address alerts related to excessive transactions per second, anomalous latencies at the engine level, excessive logon attempts, malformed FIX messages, cancel on disconnect events and excessive rejected orders. The GSA team also leads comprehensive performance testing of changes introduced to the Globex system infrastructure to ensure the reliability of the CME Globex platform.

CME Group believes that strong regulatory capabilities are essential to promoting fair and orderly markets, free from manipulative, fraudulent or disruptive activity and it is imperative that regulators have the granular audit trail and reference data, as well as the technological tools and expertise, to effectively monitor trading in the type of high speed and high messaging trading environment that exists today. Additionally, it is increasingly important that there be appropriate information sharing among regulators to ensure effective cross-venue surveillance.

Who should bear the cost of investing in such capabilities and the cost of operating and supervising the markets in order to ensure fairness among market participants? Please elaborate.

In CME Group's view, each different part of the supply chain needs to make appropriate investments in risk management and supervisory infrastructures that are commensurate with their responsibilities. As discussed above, as a market operator, CME Group has made considerable investments in its regulatory and market supervision infrastructure and has continued to innovate in this regard as the markets and technology have evolved. Trading firms and clearing firms should likewise be required to adopt and implement effective supervisory systems appropriate to their businesses and clientele. These supervisory systems necessarily involve expenditures for surveillance and risk management systems and related technology infrastructures. Finally, federal regulators should also make the investments necessary to ensure they have the capabilities to fulfill their regulatory mandates.

Q9 Do you think existing laws and rules on market abuse and disorderly trading cover computer generated orders and are relevant in today's market environment?

With respect to the U.S. futures markets, CME Group does not believe there is a need at this time to define additional practices as disruptive of fair and equitable trading. The existing statutory authority in the U.S., which following changes arising from the Dodd-Frank Act, includes amended market manipulation rules and new rules regarding disruptive trading practices, complement the pre Dodd-Frank rule set and provides more than adequate authority to address market abuses and intentional or reckless conduct that is disruptive to the market, including conduct arising from automated trading systems. Additionally, self-regulatory organizations already have rules that prohibit conduct inconsistent with just and equitable principles of trade, as well as numerous other rules that address disruptive or abusive trading practices, and are well equipped to surveil for and take enforcement action against parties who violate these rules.

The most effective regulatory approach to policing market abuse and disorderly trading in our view is to employ a combination of principles-based standards of conduct, rules and regulatory guidance that collectively provide sufficient enforcement flexibility to address market abuses and disruptive activity, while simultaneously providing sufficient clarity to market participants regarding prohibited practices. Overreliance on prescriptive regulatory standards can be counterproductive and provide opportunities for traders to engage in questionable practices that may not be in technical violation of detailed rules-based standards, and certain types of misconduct, such as that related to disorderly or disruptive trading, necessarily involves a case-by-case evaluation of the context, including, for example, the market conditions and participant circumstances involved. Regulatory bodies that are responsible for establishing and enforcing market integrity rules must strike the appropriate balance in this regard.

Although a certain level of flexibility is necessary, it is also true that market participants require clarity with respect to their obligations and fairness and consistency with regard to the enforcement of rules. Vague rules that lack sufficient clarity to enable market participants to understand what conduct is prohibited obviously are problematic and create the risk that

legitimate trading practices could be arbitrarily construed, post-hoc, to be unlawful. For example, with respect to the CFTC's new rules addressing disruptive practices, CME Group and many other market participants have urged the Commission to provide greater clarity to market participants regarding ambiguously defined prohibited trading practices such as "spoofing" and "disorderly trading on the close" in order not chill participation and undermine liquidity by creating regulatory uncertainty. Therefore, to the extent that specific practices have been identified to violate existing standards, these practices should be clearly defined and communicated via appropriate regulatory guidance.

Market participants, exchanges, and regulators have a shared interest in having market and regulatory infrastructures that promote fair, transparent and efficient markets and that mitigate exposure to risks that threaten the integrity and stability of markets. To the extent that an algorithmic trader or any other trader violates appropriately constructed regulations governing disruptive practices or manipulation, the responsible parties should be accountable and sanctioned appropriate to the egregiousness of the offense – either by the exchange on which the conduct occurred or by the applicable federal regulator. There is, however, no justification for establishing unique standards in this regard for automated traders, as manipulative or disruptive practices can occur irrespective of the means of order entry. As noted above, there must be an appropriate level of clarity with respect to the applicable rules in order that participants can avoid conduct that is unlawful.

Q10 Are there any strategies employed by HFT firms that raise particular concerns? If so, how would you recommend that regulators address them?

Market participants should never intentionally disrupt the market. Where activity can be shown to have been undertaken for the purpose of upsetting the equilibrium of the market or for the purpose of creating a condition in which prices do not reflect fair market values, such activity undermines market integrity and should be actionable. These principles are generally applicable and any market participant that runs afoul of them should be appropriately sanctioned. HFT firms employ a variety of trading strategies, few of which are unique to HFT firms, and abusive practices that HFT firms might engage in can also broadly be engaged in by non-automated traders. Therefore, regulators should focus on addressing the conduct that undermines market integrity rather than singling out the activities of a class of participants that employs a particular method of order entry.

Conduct commonly referred to as "spoofing" or "quote stuffing" are examples of "strategies" that should be prohibited, although, again, neither of these are HFT-specific issues. As mentioned earlier, however, it is important that regulators carefully distinguish legitimate from prohibited practices, and, for example, do not simply conflate high order cancellation rates with "spoofing" or high messaging rates with "quote stuffing." In CME Group's view, spoofing involves a practice of entering non-bona fide orders with intent to cancel before execution for the purpose of misleading other market participants and exploiting that deception for the spoofing entity's benefit. The distinguishing characteristic between "spoofing" and legitimate order entry and cancellation is the intent to enter non-bona fide orders for the purpose of deception. In our view, "quote stuffing" involves the intentional entry of an excessive number of order messages for the purpose of effecting quote processing inefficiencies of a marketplace or other market

participants. In both of these examples, CME Group believes that regulators should have the burden of demonstrating scienter in order to find a violation and that threshold also helps market participants to differentiate acceptable conduct from prohibited conduct.

Q11 Should charges or fees be imposed on messages, cancellations or high order-to-trade ratios? If so, how should the fees or charges be determined and on what basis?

There is nothing that is inherently disruptive about high order to trade ratios or high messaging or cancellation rates. The state of technology today allows sophisticated computer models to evaluate market conditions and diverse inputs in milliseconds or microseconds and consequently orders will be legitimately added, amended and cancelled with similar speed in response to changing conditions and inputs. Additionally, given the number and diversity of participants and strategies, markets have become extremely dynamic and efficient. Excessive messaging does have the potential to impair market efficiency by causing disruptive latencies that negatively impact other market participants, and CME Group believes that market centers should therefore have appropriate policies and mechanisms in place to manage messaging in a manner that ensures the operational efficiency of its markets.

CME Group employs automated messaging controls at the connection level to the trading engine to mitigate these types of risks, as well as the risk of a malfunctioning algorithm. If a connection exceeds the CME Group established message per second threshold over a rolling three-second window, subsequent messaging is rejected by the trading engine until the average message per second rate falls below the threshold.

CME Group additionally employs a CME Globex Messaging Policy that is broadly designed to encourage responsible messaging practices and ensure that the trading system maintains the responsiveness and reliability that supports efficient trading. Under this policy, CME Group establishes messaging benchmarks based on a per-product volume ratio which measures the number of messages submitted to the volume executed in a given product. These benchmarks are tailored to the liquidity profile of the contract to ensure that contract liquidity is not compromised. CME Group works with firms who exceed the benchmarks to refine their messaging practices and failure to correct excessive messaging results in a surcharge billed to the clearing firm.

Inappropriately taxing order cancellations would prove counterproductive and harm liquidity and market stability. Every order entered into the market represents liquidity, albeit of varying quality depending on where in the book it is entered, because all orders are available to be executed against for as long as they remain in the order book. If order cancellations are taxed, participants will most likely reduce their quoting away from the best bid or offer as those bids and offers are less marketable at the time they are entered; the impact will be less depth deeper in the order book. When there is significant market volatility, liquidity deeper in the book is important to maintaining stability because in an electronic environment liquidity can be consumed exceptionally rapidly and deeper bids can quickly become the best bids. If those bids are not present as a result of artificial disincentives to quoting, volatility will be exacerbated.

Q12 Should market operators be required to make their co-location services available on a fair and non-discriminatory basis?

CME Group agrees that market operators should be required to make their co-location services available on a fair, transparent and non-discriminatory basis. As the operator of a state-of-the-art co-location facility that will come on-line in early 2012, CME Group's guiding principle with respect to co-location services is that all CME Group exchange customers will be treated equitably. CME Group's co-location and proximity hosting services are available to all willing and qualified customers of CME Group markets in an equitable and fair manner.

Q13 Should market operators be required to provide testing environments to enable participants in stress test their algorithms? If so, what kind of minimum requirements are reasonable?

CME Group believes that it is of paramount importance that algorithms be properly tested prior to being deployed in production in order to mitigate potential risks both to the trading entity and to the broader market. Market participants should be responsible for conducting appropriate testing of their trading algorithms, as participants routinely do today in their own, often sophisticated, testing environments using historical data to test the performance of particular strategies against a wide range of market conditions. Participants may capture and store data in-house for these purposes or rely on vendors who compile and can replay data feeds from exchanges around the world, thereby allowing market participants to back test their algorithms across multiple venues or against a variety of particular market conditions, including, for example, high volatility environments or sudden liquidity crises. Exchanges also commonly make their own historical data available.

Market operators should be responsible for providing conformance testing functionality to users of their markets to ensure that the trading systems connecting to the trading host will not adversely impact the connecting client or the market. CME Group currently offers two such testing environments to its users - the "certification" and "new release" environments. Customers use the CME Group certification environment, which mirrors the production environment, to perform certification testing for CME Globex core functionality, maintenance testing and development testing for new customer system features. Customers use the new release environment to test new CME Globex products and releases prior to production. Both the certification and new release environments are connected to their own clearing testing environments. This allows customers, who have clearing setup in the production environment, to perform end-to-end testing by submitting and executing orders from their front-end systems and receiving the corresponding clearing trade reports on their back-end systems in conditions similar to production.

Q14 To what extent do you have other comments related to the risks to market integrity and efficiency raised by the issues in this report?

Algorithmic and high frequency trading have developed in response to market structure evolution and technological advances that will not be reversed. These traders unequivocally play an important and productive role in today's markets, and the risks to market integrity and

stability associated with automated and high speed trading are substantially mitigated when such activities are properly supported by the types of testing and supervision protocols, pre-trade and post-trade risk controls, and exchange volatility mitigation tools detailed above. Automated traders and their clearing firms should be required to implement appropriate risk management and supervisory compliance structures that are tailored to the nature of their business, and exchanges should be required to adopt appropriate automated risk management mechanisms to mitigate the unique risks associated with operating very fast electronic markets.

The evidence to date strongly suggests that algorithmic and high frequency trading increase liquidity and transparency in the marketplace and narrow spreads, reducing participants' transaction costs, in addition to providing myriad operational and market efficiencies. Thus, before recommending restrictions on these activities, careful consideration should be given to the important beneficial role played by these traders and to the impact of any recommendations on the liquidity and efficiency of the market.

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We appreciate the opportunity to comment on the Plan and urge IOSCO to take into account our comments and those provided by other market participants. We are happy to discuss any questions concerning the comments contained in this letter and are otherwise available to assist IOSCO in its efforts to enhance the stability and integrity of the markets.

Please feel free to contact me at (312) 435-3687 or via email at Bryan.Durkin@cmegroup.com, or Dean Payton, Deputy Chief Regulatory Officer, at (312) 435-3658 or Dean.Payton@cmegroup.com.

Sincerely,

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