

AUTOMATED TRADING STRATEGIES

Managing the Machine: How Hedge Fund Managers Can Examine and Document Their Automated Trading Strategies (Part One of Two)

By Douglas A. Rappaport, Patrick M. Mott and Elizabeth C. Rosen

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The criminal “spoofing” conviction of Michael Coscia, principal of Panther Energy Trading LLC, on November 3, 2015, shined the media’s spotlight once again on U.S. financial regulators’ race to address the threat of market disruption posed by automated trading (AT). Although the prosecution of Coscia may have been the first to ask a jury to find beyond a reasonable doubt that an algorithmic trading strategy had been devised with manipulative intent, regulators have been intensely focused on mitigating the risks of AT ever since the “Flash Crash” of May 6, 2010.^[1] The risks and the regulatory responses thereto are not limited to market disruption caused by intentionally deceptive practices such as spoofing. As the \$440 million trading error at Knight Capital in August 2012 demonstrated, market disruptions can also arise from what might first appear to be a minor glitch in the software deployed by one of the many firms around the globe engaged in AT strategies.

Not surprisingly, financial regulators have been urging firms to implement policies and controls to mitigate the likelihood that their AT strategies will disrupt the markets. Most recently, on November 24, 2015, the CFTC issued its Notice of Proposed Rulemaking on Regulation Automated Trading (Regulation AT), proposing risk controls and other restrictions for certain market participants that use algorithmic trading systems.^[2]

Among other things, Regulation AT in its current form would require covered market participants to register with a self-regulatory organization, establish various types of pre-trade controls and implement procedures for the development, testing and monitoring of their algorithmic trading systems.^[3] Although the SEC has not yet proposed an equivalent regulation for AT in securities, European firms will soon be subjected to

similar requirements for their algorithmic trading systems in all markets covered by the Markets in Financial Instruments Directive (MiFID II), including the equities markets.^[4] FINRA and several industry organizations have also begun to fill in the gaps on the U.S. equities side by issuing detailed guidance covering everything from pre-trade controls to system documentation procedures.^[5]

Up until recently, firms using algorithmic trading systems may have been able to rely on generic policies to ensure compliance with applicable SEC and CFTC trading regulations. In the securities context, current FINRA rules already require FINRA-registered firms to ensure their “procedures are reasonably designed with respect to [their] activities . . . to achieve compliance with applicable securities laws and regulations, and with applicable FINRA rules.”^[6] The clear upshot of Regulation AT and the proliferation of guidance from self-regulatory and industry organizations, however, is that all firms that use AT strategies must begin the process of establishing specific policies and controls designed to mitigate the particular risks associated with those strategies.

For the vast majority of legal and compliance professionals without degrees in math or computer science, this may appear at first glance to be a daunting task. In this two-part guest series, Douglas A. Rappaport, Patrick M. Mott and Elizabeth C. Rosen of Akin Gump outline five high-level first steps for legal and compliance professionals to jumpstart the process of designing and implementing a control framework tailored to a hedge fund manager’s particular AT program that will stand up to regulatory scrutiny.^[7] This article will cover the first two steps, including conducting a risk assessment of and documenting the AT system. The second article

will explore the remaining steps, addressing protocols for monitoring and reviewing trading activity, code and disclosures. For additional insight from Rappaport, see *"How Can Hedge Fund Managers Understand and Navigate the Perils of Insider Trading Regulation and Enforcement in Hong Kong and the People's Republic of China?"* (Mar. 28, 2013). For insight from other Akin Gump partners, see *"Non-E.U. Hedge Fund Managers May Not Be Required to Comply With AIFMD's Capital and Insurance Requirements"* (Jul. 9, 2015); and *"Structuring Private Funds to Profit From the Oil Price Decline: Due Diligence, Liquidity Management and Investment Options"* (Mar. 19, 2015).

Step One – Conduct a Thorough Assessment of the Risks Associated With the Firm's AT Strategies

Not all AT systems are created equal. The first step in designing any compliance controls for an AT system is to understand how the system works and what risks might be associated with its operation.

Understanding the AT Strategies or Systems

At many firms, legal and compliance professionals may have had little or no role in the initial design of the firm's AT strategies or systems. However, the specialists who designed the system and the traders who operate it on a day-to-day basis must be able to explain to legal or compliance personnel how the system operates and how the strategy is expected to make money for the firm. If they cannot explain the system or strategy to their own internal control personnel, how will they explain them to a regulator?

If nobody in the legal or compliance departments is capable of understanding the firm's AT system due to its complexity, an independent consultant may help with the process of designing appropriate policies and procedures to govern the system's operations. It is imperative that somebody from legal and compliance have an active role in the process of designing and maintaining the control framework. Any control

framework devised entirely by the traders who will be using the AT system to generate profits will be viewed unfavorably by regulators.

Identifying Risk Areas

Once there is a basic understanding of the AT system and strategy, the next step in the risk assessment is to identify the features of the system that could cause a market disruption or significant losses for the firm in the event of a technical defect or intentional abuse of the system.^[8] Important areas of focus should include the data feeds on which the system relies, the AT system's connection to those data feeds, the codes that run the AT system, the methods for changing those codes, as well as the system's method of transmitting orders or proposed trades.

A key determination to make in this step is whether the firm's system simply generates proposed trades that must be reviewed and submitted for execution manually by a human or whether the firm's system actually submits orders automatically without any intervening action by a member of the firm. AT systems that submit orders without human intervention – whether to a broker or directly into the market – pose a greater risk of market disruption due to a technical glitch that would result in unintended orders entering the market.^[9] Conversely, a firm that simply uses a computer algorithm or system to determine whether to initiate a trade but requires humans to manually input the trades in a front-end system poses a lesser risk of market disruption and may require fewer layers of internal controls to ensure that its system poses no market or compliance threat.^[10]

Step Two – Document the Strategy and Design of the AT System

Legal or compliance personnel will likely commence Step Two simultaneously with Step One. As compliance professionals learn the "ins and outs" of their firms' AT systems, they should begin to document the strategy and design of those systems. The purpose of this is twofold: (1) to lay the groundwork for creating

a compliance system that will precisely map onto the trading system; and (2) to provide a record or schematic to present to regulators – something that the regulators will understand when they come to examine the AT systems.

This process brings compliance professionals' role as translators between AT specialists and regulators to the fore. The ability to both explain an AT system to a regulator and support that explanation with historical, contemporaneous and fulsome documentation will go a long way toward increasing a firm's credibility; preventing an unnecessarily prolonged or intrusive government inquiry; and enhancing the firm's ability to comply effectively with the law.

In addition, some version of this documentation will be required for firms subject to Regulation AT.^[11] If, for example, the AT system does not submit orders and instead only proposes trades for review by a human trader, this process will give a compliance professional the chance to highlight this fact, which may persuade regulators to spend less time digging into the workings of the system than they otherwise would. Firms must be careful, however, to use language that is broad enough to cover technical changes that might be made to the system at some point in the future.

Author biographies and footnotes to follow Part Two.

AUTOMATED TRADING STRATEGIES

Managing the Machine: How Hedge Fund Managers Can Examine and Document Their Automated Trading Strategies (Part Two of Two)

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Although many hedge fund managers and other firms using automated trading (AT) strategies have relied on generic policies to comply with applicable regulations, with the advent of initiatives such as the CFTC's Notice of Proposed Rulemaking on Regulation Automated Trading (Regulation AT) and restrictions on AT strategies imposed by the revised Markets in Financial Instruments Directive, that reliance will no longer be satisfactory. Rather, under Regulation AT and other guidance from self-regulatory and industry organizations, firms that use AT strategies must establish specific policies and controls to mitigate the particular risks associated with those strategies.

In this two-part guest series, Douglas A. Rappaport, Patrick M. Mott and Elizabeth C. Rosen of Akin Gump outline five high-level first steps for legal and compliance professionals to jumpstart the process of designing and implementing a control framework tailored to a hedge fund manager's particular AT program that will stand up to regulatory scrutiny. This second article explores the final three steps, addressing protocols for monitoring and reviewing trading activity, code and disclosures. The first article covered the first two steps, including conducting a risk assessment of and documenting the AT system. For additional insight from Rappaport, see "*Perils Across the Pond: Understanding the Differences Between U.S. and U.K. Insider Trading Regulation*" (Nov. 9, 2012). For insight from other Akin Gump partners, see "*Non-U.S. Enforcement, Insider Trading in Futures, Failure to Supervise Charges and Other Evolving Insider Trading Challenges for Hedge Fund Managers*" (Nov. 21, 2013).

Step Three – Establish Protocols for Continuous Monitoring of Trading Activity

Once compliance professionals have an understanding of and have documented their firms' existing AT

systems, they must design protocols and controls that will continuously protect against potentially adverse market effects to satisfy regulators. To start, they should go through the documentation created in Step Two; list the potential risks posed at each stage of that particular AT process (as gleaned in Step One); and brainstorm mechanisms to mitigate, diminish or eliminate those risks.

Broadly speaking, an adequate compliance strategy should include both pre- and post-trade controls. Although the resulting controls should be executed by compliance professionals, rather than AT specialists, the process of developing these controls should not be conducted in a vacuum. Rather, compliance personnel should involve traders and counsel in the discussions as well.

The actual parameters of controls and monitoring protocols must be tailored to a firm's specific AT systems. However, some commonly recommended types of control and monitoring, which could be relevant to many, if not most, AT firms, include the following:

- Maximum order size limits;
- Average daily volume checks;
- Maximum intraday position limits;
- Market data reasonability checks;
- Price tolerance limits;
- Repeated automated execution limits;
- Exchange dynamic price collars;
- Exchange market pauses;
- Exchange message programs; and
- Message throttles.^[1]

The types of controls implemented, the exact forms those controls take and the specific information a firm

chooses to monitor should be designed to identify and prevent unintended results that may reflect a failure at the firm or in the market.^[2] For instance, order price parameters and maximum order size limits are intended to identify and prevent orders far from the prevailing market price from entering the market.^[3] The levels that firms set for these controls will depend on the particular characteristics of their businesses and AT systems.

One post-trade control that has gained special attention from regulators and industry leaders is the “kill switch.” Again, the precise form, thresholds, and qualities of a kill switch will vary from firm to firm. But, the basic idea is the same: the creation of a mechanism by which a manager can immediately halt activity identified through monitoring as potentially harmful or disruptive to the market. This mechanism has the potential to save the market and its participants from additional damage and can be designed to cancel or prevent trades, either automatically or manually.

Although already exploring the use of kill switches in various forms, members of the AT industry are generally concerned with how to design a kill switch that will be sensitive enough to protect the market, yet flexible enough to accommodate risk-reducing orders. Recognizing this concern, regulators have not implemented standard thresholds for such kill switches to date. In order to demonstrate that rigid, prescriptive regulation in this area is not necessary or desirable, firms should be sure to articulate and memorialize their reasons for setting the thresholds for their uniquely designed kill switches and to document the effectiveness of those kill switches in preventing or reducing market disruption.

Firms must not only collect information gathered through the above-listed controls, they must ensure that exception reports are brought to the attention of an independent control person who will swiftly analyze and address any issues.^[4] Although the design of compliance systems will necessarily require the involvement of AT specialists, compliance oversight should be performed by personnel outside of the AT operation. Otherwise, regulators will be highly skeptical that the measures are enforced and effective.

In conjunction with establishing these protocols, firms should conduct renewed training to ensure awareness and understanding of, as well as adherence to, the new policies. Firms might also want to consider placing appropriate controls and limitations on traders’ abilities to overwrite or otherwise evade system controls.^[5]

Step Four – Create a Written Policy Framework for Reviewing, Testing and Documenting New Code or Changes to Existing Code

AT is a highly dynamic area, and a firm’s AT system will not remain static over time. Rather, it will evolve and adapt. But changes must be evaluated carefully and with an eye toward regulation. Even after developing a compliance strategy that satisfies regulators as to current operations, a manager’s legal and compliance department must pair that strategy with policies that will ensure any changes to the firm’s AT system – particularly changes involving algorithms and codes – do not sabotage the carefully constructed compliance strategy presently in place.

Similar to guidance from FINRA and the European Securities and Markets Authority (ESMA), the proposed Regulation AT would require any new or altered code to undergo rigorous testing prior to implementation. Real-world and stress testing could be particularly useful in identifying circumstances that may contribute to future AT compliance or disruption issues.^[6] Historical data can be harnessed to inform these tests.^[7]

Developing such tests will also require the input of current traders and other AT specialists who can advise on up-to-date real-world scenarios and concerns. But written policies around testing should call for the involvement of control personnel (compliance, legal, etc.) at key choke points, including the initial design phase.^[8] The firm should not only conduct testing but also review it for specified criteria. Further, firms should include data integrity as part of the testing.

Regulation AT would also require firms to maintain a source code repository to manage and track source code access and changes to that code.^[9] The source

code repository should include an audit trail of material changes to source code that would allow AT personnel to determine the following for each material change: who made it, when they made it and the coding purpose of the change.^[10]

The source code should also be maintained in accordance with CFTC regulation § 1.31. Again, this is in line with the theme of documentation plus reasoning. Overall, compliance professionals should aim to maintain a record to present to regulators which demonstrates that the firm thoughtfully and carefully operated its AT system and that its code changes were reasonable and responsible in the context in which they were made.

Step Five – Review Disclosures for Consistency With Practice

Another stated goal of recent regulatory actions and proposals is to enhance the transparency of AT systems. Reviewing investor disclosures for thoroughness and accuracy has long been important. However, a 2009 fumble by the quantitative trading firm AXA Rosenberg brought the problem of transparency in AT specifically to the fore.

The SEC charged AXA Rosenberg with violating numerous anti-fraud statutes based on the fund's alleged concealment of an error in the computer code of its quantitative investment model, which allegedly caused \$217 million in investor losses.^[11] At the time, The New York Times described quant funds as "the 'black boxes' of investing – portfolios run by managers who generally try to generate profit with computer algorithms that they don't share with outsiders, or even their own investors."^[12] A spokesman for one investor, which pulled its capital from the fund following revelation of the error, stated the coding error was less of an issue than the amount of time AXA Rosenberg took to inform investors of the mistake.^[13]

AXA Rosenberg ultimately settled with the SEC. In a press release announcing the settlement, Bruce Karpati, then co-chief of the asset management unit in the SEC Division of Enforcement, remarked, "Quant managers

must be fully forthcoming about the risks of their model-driven strategies, especially when errors occur and the models don't work as predicted."^[14] The incident prompted both investors and regulators to increase their scrutiny of quant trading practices and likely inspired much of the AT regulatory action to date.

One way Regulation AT seeks to increase AT transparency – including risks for investors – is to require an unprecedented level of communication from firms to designated contract markets (DCMs). "Specifically, the proposed rules would require AT [specialists to] prepare, certify, and submit annual reports [to DCMs on which they operate] . . . their controls for: (1) maximum AT Order Message frequency; (2) maximum execution frequency; (3) order price parameters; and (4) maximum order sizes."^[15] In addition, the futures commission merchants (FCMs) acting as clearing members for those AT specialists would similarly have to report "regarding [their] program[s] for establishing and maintaining those same controls."^[16]

The stated purposes behind these new disclosure rules are: (1) to provide DCMs with "a clearer understanding of the pre-trade risk controls" of AT specialists operating on their platforms (information on which they can base their own controls and which they can use to inform investors); and (2) to act as a check on AT specialists, to whom the regulation would provide "great flexibility" to ensure they are reasonably complying.^[17]

Regulation AT would also require AT specialists and FCMs to provide DCMs with access to books and records related to these annual reports upon request. [18] It remains to be seen whether other regulators will propose similar requirements on non-futures markets, effectively turning them into private bodies with quasi-regulatory obligations.

Firms should compare past and current disclosures with these requirements to see how they measure up to this potential new standard of transparency. At the same time that they are documenting their processes for developing the various controls, firms should also consider how to organize the information they collect

in order to meet these new reporting requirements, as well as how to best package and present that information to serve investors, DCMs and other markets for which these types of disclosure may soon be required.

Compliance professionals should also have a discussion with AT specialists about anticipated new rules and controls DCMs and other markets might impose as a result of the new requirements they could face.^[19] Anticipating the likely reaction of the markets to their own new oversight and reporting requirements will help prepare firms for this possibility and avoid the need to entirely redo or revise policies shortly after their creation.

Conclusion

The steps outlined in this series are a jumping-off point for legal and compliance personnel to think about more specialized, finely tailored compliance policies for AT systems. They begin with the first process required for any new undertaking: education. Compliance professionals need to educate themselves about the practice of AT and, in particular, the specific forms it takes within their firms.

Upon that foundational knowledge, with the assistance of AT specialists and with an eye toward the most recent information coming from regulators, compliance professionals should carefully design controls that combine automated and manual features; rigorous testing; and diligent, fulsome documentation. No matter the particular rules regulators institute to police AT in the future, these elements will nevertheless serve well the firms who will be subject to those regulations.

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Part One

[1] The DOJ has also claimed that the Flash Crash resulted from the criminal use of spoofing algorithms by Navinder Singh Sarao, a U.K.-based trader. See criminal complaint, *U.S. v. Singh Sarao*, No. 15-CR-75 (N.D. IL Feb. 11, 2015).

[2] CFTC, *Notice of Proposed Rulemaking on Regulation Automated Trading* (Regulation AT) (Nov. 24, 2015) (CFTC Notice).

[3] CFTC Notice Fact Sheet (Nov. 24, 2015).

[4] European Commission, *Updated rules for markets in financial instruments: MiFID 2* (June 12, 2014).

[5] See, e.g., FINRA, *Regulatory Notice 15-09* (March 2015); FIA, *FIA Guide to the Development and Operation of Automated Trade Systems* (Mar. 23, 2015).

[6] FINRA Rule 3120(a)(1). See also NFA Rule 2-9.

[7] The article is not intended as a comprehensive summary of all new proposed regulations, but rather as a general action plan legal and compliance professionals can follow to help bring their firms into compliance with existing and proposed regulations.

[8] A summary of risks associated with AT can be found in a joint report issued by various U.S. financial regulators. *Joint Staff Report: The U.S. Treasury Market on October 15, 2014, Appendix C* (July 13, 2015) prepared by the U.S. Department of Treasury, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, U.S. SEC, and CFTC. Risks and potential solutions are also discussed in a Treasury Market Practices Group white paper. Treasury Market Practices Group, *Automated Trading in Treasury Markets*, at 5 (June 2015).

[9] Additional requirements apply to trading directly into the market. In November 2010, the SEC adopted the "Market Access Rule," which requires brokers and dealers to have risk controls in place before providing their customers with access to the market. Specifically, the controls must prevent entry of (i) orders exceeding appropriate pre-set credit or capital thresholds in the aggregate for each customer and the broker-dealer; and (ii) erroneous orders, by rejecting orders that exceed appropriate price or size parameters, on an order-by-order basis or over a short period of time, or those that indicate duplicative orders. CFTC Notice at 27 (citing Securities Exchange Act Rule 15c3-5 (Market Access Rule)), 75 FR 69792 (Nov. 15, 2010); SEC Press Release No. 2010-210, "*SEC Adopts New Rule Preventing Unfiltered Market Access*" (Nov. 3, 2010), *SEC, Responses to Frequently Asked Questions Concerning Risk Management Controls for Brokers or Dealers With Market Access* (Apr. 15, 2014).

[10] For example, according to the definition of "algorithmic trading" in the current version of Regulation AT, firms that simply use a computer algorithm or system to determine whether to initiate a trade but then require humans to manually input the trades in a front-end system with no further discretion by any computer system or algorithm prior to execution may not be subject to Regulation AT's requirements. CFTC Notice at 65.

[11] See CFTC Notice at 315. The proposed regulations would also require firms to establish written policies and procedures with instructions for how to conduct this documentation.

Part Two

[1] *FIA Guide to the Development and Operation of Automated Trade Systems* (Mar. 23, 2015) at 8-13. Regulation AT would require some form of message and execution throttles; order price parameters and maximum order size limits; kill switch; and self-trade prevention rules created by DCMs. See, generally, CFTC, *Notice of Proposed Rulemaking on Regulation Automated Trading* (Nov. 24, 2015) (CFTC Notice) at 117.

[2] FINRA, Regulatory Notice 15-09 (March 2015) (FINRA Notice) at 6.

[3] CFTC Notice at 117.

[4] See FINRA Notice at 7. Regulation AT would require firms to implement some form of the following: continuous, real-time monitoring of trading; automated alerts; monitoring staff with authority and ability to trigger the kill switch, including the ability to coordinate with the DCM and clearing firm staff to obtain information and cancel orders; dashboards to monitor and interact with the AT system; and sufficient procedures to track which monitoring staff is responsible for an AT system.

[5] FINRA Notice at 7.

[6] CFTC Notice at 468.

[7] *Id.*

[8] See FINRA Notice at 6-7.

[9] CFTC Notice at 469.

[10] This idea is not entirely new, as the SEC and FIA have also adopted rules and guidance requiring some sort of "audit trail." See CFTC Notice at 30, 44. But the repository requirements outlined in Regulation AT appear more specific and comprehensive than previous regulatory efforts.

[11] Press Release, U.S. SEC, *SEC Charges AXA Rosenberg Entities for Concealing Error in Quantitative Investment Model* (Feb. 3, 2011).

[12] Jeff Sommer, *The Tremors From a Coding Error*, N.Y. Times (June 19, 2010), available at <http://www.nytimes.com/2010/06/20/business/20stra.html>.

[13] *Id.*

[14] *Id.*

[15] CFTC Notice at 162.

[16] *Id.*

[17] *Id.*

[18] *Id.*

[19] A full discussion of those requirements is beyond the scope of this article, but key features would require (1) DCMs to ensure AT firms are complying with pre-trade and other risk control requirements; and (2) DCMs to disclose any attributes of an electronic matching platform or trade execution facility that materially impact market participant orders but which are not readily apparent to a market participant. See CFTC Notice at 173, 178.