Guidance for Firms Working with Third-Party Algorithmic Trading System Providers on European Governance and Control Requirements

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1. Introduction

FIA[1] has been a leading proponent of principles-based regulation for algorithmic trading and has consistently recommended a pragmatic approach to the development and deployment of automated trading systems as well as the risk controls used to manage their operation in live markets. [2]

Global regulations increasingly place responsibilities on firms[3] using algorithm trading systems to document their deployment, use and governance. Recent developments in MiFID II (notably requirements outlined in Commission Delegated Regulation (EU) 2017/589 ('**RTS 6**')),[4] the PRA Supervisory Statement on Algorithmic Trading,[5] and the FCA Algorithmic Trading Compliance in Wholesale Markets,[6] amongst others, have led firms to require more detailed inventories of their algorithms and risk controls, as well as the audit trails that demonstrate their development, change, testing, and release processes. Such requirements are driving the need for more detailed information from third-party providers of algorithmic trading systems who may not be subject to the same regulations as the firms employing their software.

The objective of this paper is to offer principles-based guidance for firms working with third-party providers of algorithmic trading systems, and to assist them to meet their requirements for oversight of outsourced services.

This paper is *not* intended to provide an exhaustive or comprehensive compliance framework for regulated firms outsourcing algorithmic trading systems from third-party providers. Instead, it utilises a sampling of key requirements from MiFID II, PRA and FCA publications.

The paper does not discuss the means of complying with any requirements, as possible approaches vary widely. For example, third-party providers may publish documents and attestations to their customers or may enable their customers to perform certain tasks by themselves through the provision of user acceptance testing environments. Ultimately, it is up to the involved parties to find an approach that serves them best. Firms should seek appropriate counsel with regards to their specific regulatory requirements and may choose to take a more prescriptive approach to their oversight of third-party providers based on their own compliance requirements rather than the principles-based approach outlined within this guidance.

This document has been produced in consultation with a variety of firms and third-party providers.

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[1] FIA is the leading global trade organization for the futures, options and centrally cleared derivatives markets, with offices in Brussels, London, Singapore and Washington, D.C. FIA's membership includes clearing firms, exchanges, clearinghouses, trading firms and commodities specialists from more than 48 countries as well as technology vendors, lawyers and other professionals serving the industry. FIA's mission is to support open, transparent, and competitive markets; protect and enhance the integrity of the financial system; and promote high standards of professional conduct. As the principal members of derivatives clearinghouses worldwide, FIA's member firms play a critical role in the reduction of systemic risk in global financial markets. Further information is available at www.fia.org.

[2] FIA Guide to the Development and Operation of Automated Trading Systems, published March 2015

[3] Within this document we use the term "firm" to describe a regulated entity offering various financial services, notably the provision of algorithmic trading services to its clients, or its own use of algorithmic trading systems.

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0589&from=en

[5] https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/supervisory-statement/2018/ss518.pdf

[6] https://www.fca.org.uk/publication/multi-firm-reviews/algorithmic-trading-compliance-wholesale-markets.pdf

2. Scope

This document has been written to address algorithmic trading requirements within the European Union and United Kingdom and is aimed at both firms who outsource their algorithmic trading systems to third-party software providers, and those third-party providers. Third-party providers are typically not regulated entities and may not be aware of the requirements that their customers – as regulated entities – have regarding the oversight of the providers' algorithmic trading systems, particularly with regards to how they are required to demonstrate appropriate due diligence with regards to their software development life cycle framework.

While the document references specific EU and UK requirements for regulated firms, we do not suggest that such requirements are applicable for other jurisdictions. Firms and third-party providers of algorithmic trading systems operating in other jurisdictions should review local requirements.

3. Third-Party Algorithmic Trading System Governance and Control

3.1 Key Information Required by Regulated Firms

The following sections provide a guide for the different types of information required by regulated firms for all algorithmic trading systems, including those outsourced or procured from third-party providers.

The suggestions within this section of the document are intended as guidance and are not exhaustive lists.

3.1.1 Static Information

Static information holds the key information items that describe the algorithm. Third-party providers of algorithmic trading systems should provide information that describes the algorithm and its purpose.

As the number of algorithms provided increases, third-party providers *may* decide to document a hierarchy or taxonomy of algorithms, indicating where identical practices and risk controls apply to several algorithms marketed independently, examples include:

(i)   stop, stop limit, one-cancels-other or other types of contingent orders, which use identical code paths and therefore described only once; or

(ii)   a time weighted average price (TWAP) algorithm may just be a specific parameterisation of a volume-weighted average price (VWAP) algorithm, and again use an identical code path.

However, this should be at the discretion of the third-party provider as to whether to disclose information that may be proprietary in nature regarding the underlying design of the algorithms, particularly if the information is irrelevant to the taxonomy.

If a common risk layer is utilised by the third-party provider, then it may be more appropriate to document this as a standalone item linked on each algorithm reference document.

Examples of static information below (at the individual algorithm, or group algorithm level):

      (iii)   algorithm name(s);

      (iv)   overview of functionality;

      (v)   risk controls, including how and where limits are set as well as the effect of triggering those controls (e.g. alert, suspend, reject);

      (vi)   parameters (calibration) relevant to execution or an overview of the model which generates those parameters (e.g. a volume profile for a VWAP algorithm); and

      (vii)   any other specific functions for the algorithm.

Third-party providers vary in approach to controls; often risk controls sit in a separate risk layer outside of individual algorithms. More sophisticated algorithms (for example those designed to trade around benchmarks such as market open or close, or other optimisations of algorithms) may use a set of common controls as well as others unique to the needs of the algorithm.

As well as the algorithm's static data, information regarding the framework employed by the third-party during the development process, is also required to demonstrate the governance model employed by the third-party provider, for example, the software development lifecycle framework or other methodology utilised for design, development, testing, release and review.

Note that this should not be required on a release notification basis, however the existence of a framework must be known and accepted as suitable for a firm to use the third-party provider's algorithmic trading systems.

The table below shows selected requirements relating to static information on algorithmic trading systems for regulated firms. We note that several points within the table may not be directly relevant to a third-party provider but are included for the purpose of demonstrating the types of requirements applied to regulated firms.

Static Information (Not Exhaustive)		
Sample Regulatory Text	**Article**	**Detail**
[PRA Supervisory Statement SS5/18](#)	2. Governance	2.3(d) Accurate inventories of algorithms and risk controls
		2.3(f) Sharing trading incidents
		2.7(f) Minimum risk controls
		2.7(g) Calibration of risk controls
	3. Algorithm Approval Process	3.1(a) Capture new algorithms
	5. Inventories and documentation	5.1 Comprehensive inventory of algorithms, controls, architecture
		5.2 Inventories updated at least annually
		5.3 Algorithmic inventory
		5.4 Risk inventory
		5.6 Documentation of strategies
		5.7 Documentation of system architecture
[FCA Algorithmic Trading Compliance in Wholesale Markets](#)	2. Defining algorithmic trading	2.12 Algorithm inventory
	3. Development and Testing	3.9 Documentation and audit trail
[MiFID II Commission Delegated Regulation (EU) 2017/589](#)	1. General Organisational Requirements	1.a Clear lines of accountability to approve the development, deployment and subsequent updates

Table 1. Sample Static Information

3.1.2   Change Information

Change information should include information specific to the type of change being made to the algorithms:

- type of change (new release, enhancement, customisation, bug-fix, regulatory requirement, etc.);

- any changes to functionality;

- any changes to behaviour;

- any changes to parameters;

- any changes to controls; and

- additional information appropriate for the firm to infer the level of risk associated with the change.

If the release is a bug-fix rather than enhancement then details should be given, for example:

- brief description of item being addressed;

- area of impact (markets, order types, latency, etc.); and

- brief description of remedial action taken.

Information on the framework used to test changes should also be provided. Evidence of a good change and testing framework at the third-party provider helps limit the amount of information required within the third-party provider's release notes.

The table below shows selected requirements relating to change information on algorithmic trading systems for regulated firms.

Change Information *(Not Exhaustive)*		
Regulatory Text	**Article**	**Detail**
PRA Supervisory Statement SS5/18	2. Governance	2.7(c) Approval and decommissioning
		2.7(d) Testing and validation
	3. Algorithm Approval Process	3.1(b) Capture customisation and amendments to existing algorithms
		3.3(b) Successful completion of testing
	4. Testing and deployment	4.4 All variations (including regional) tested
FCA Algorithmic Trading Compliance in Wholesale Markets	3. Development and Testing	3.1- 3.5 Development and testing framework
		3.6 -3.7 Approval and sign off
MiFID II Commission Delegated Regulation (EU) 2017/589	5. General Methodology	5.1-5.7 Testing and deployment of trading algorithms systems and strategies
	11. Management of material changes	11.1-11.2 Management of material changes

Table 2. Sample Change Information

3.1.3   Release Procedures
Release procedures should hold the information about the release and deployment of the algorithm, for example:

- deployment date;

- approval date; and

- approval owner (area or person).

Information on the framework used for the release process should also be provided. Evidence of an appropriate release framework at the third-party provider helps limit the amount of information required within the third-party provider's release notes.

As we have noted, while third-party providers of algorithmic trading systems are typically not directly regulated, their release procedures are of increasing interest to their regulated customers since obligations on the regulated firm has led them to apply more oversight and control of production systems. Clear engagement and supporting documentation from third-party providers assist firms to meet their own internal and regulatory obligations, and lack of transparency in how third-party providers release changes into production could lead to the regulated firm being non-compliant with regards to governance oversight or documentation, and potentially registration of algorithms where so required.

The table below shows selected requirements relating to release procedures on algorithmic trading systems for regulated firms.

Release Information (*Not Exhaustive*)		
Regulatory Text	**Article**	**Detail**
PRA Supervisory Statement SS5/18	2. Governance	2.7(c) Approval and decommissioning
		2.7(d) Testing and validation
	3. Algorithm approval process	3.3(b) Successful completion of testing
	4. Testing and deployment	4.1 Pre-deployment testing
		4.2 Re-validation of algorithms and risk controls
		4.4 All variations (including regional) tested
		4.6 Latency and capacity testing
		4.9 Identified testing issues documented
FCA Algorithmic Trading Compliance in Wholesale Markets	3. Development and Testing	3.8 Deployment procedure
MiFID II Commission Delegated Regulation (EU) 2017/589	5. General Methodology	5.7 An investment firm shall keep records of any material change
	8. Controlled deployment of algorithms	8(a)-(d) Controlled deployment of algorithms

Table 3. Sample Release Procedure Information

FIA notes that third-party providers have multiple relationships with regulated firms. Where it is appropriate, third-party providers may wish to develop the ability to decouple their releases so that they can be applied at individual customer level, such an approach assists with streamlining the change approval and release process so that deployment can occur for those firms that have been approved without being held back by those yet to approve. However, we recognise that this is not always an option, and it may be technically

impractical to decouple releases by customer. As such, good governance and communication processes, as outlined in this guidance, will assist both the third-party provider in its need to deploy changes and firms' requirements to meet regulatory requirements.

3.2   Stress Testing

Article 10 of RTS 6 requires an annual stress test to be performed on the algorithmic trading system. The regulation is prescriptive regarding the calculation of volumes that should be tested through the system. It is also clear that the procedures and controls described in RTS 6 Articles 12 to 18[7] should also be tested as part of the exercise to ensure full functionality of the algorithmic trading system. The test is not just a measure of the algorithms and their ability to process high message volumes, but also requires the performance of the algorithms' controls to be noted.

Third-party providers of algorithmic trading systems should clearly define their algorithmic trading infrastructure to identify all system components and controls that make up the algorithmic trading system. It will be this 'system' of infrastructure and controls that will need to be assessed during the stress test.

Third-party providers of algorithmic trading systems should also note that under RTS 6 Article 10 their customers who are regulated firms are required to include the stress testing as part of their annual self-assessment (as described in RTS 6 Article 9). As such, third-party providers of algorithmic trading systems should consider the timing of the stress test and the publication of evidence to regulated firms, so as not to delay the publication of the annual self-assessment.

For larger institutions, the collation of evidence for their self-assessment may start earlier in the year to allow for internal review and sign-off within the submission timeframes.

It is also suggested that third-party providers of algorithmic trading systems consider running their stress tests more frequently than once a year. This will ensure valid evidence is readily available for regulated firms when they require it.

4. Summary

As we have noted, due to recent developments in MiFID II, the PRA Supervisory Statement on Algorithmic Trading, and the FCA Algorithmic Trading Compliance in Wholesale Markets, regulated firms increasingly need more evidence of control over their algorithmic

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[7] Articles 12 to 18 are described in Chapter II "Resilience of Trading Systems", Section 3 "Means to ensure resilience", and cover the following topics:

- Article 12 Kill functionality
- Article 13 Automated surveillance system to detect market manipulation
- Article 14 Business continuity arrangements
- Article 15 Pre-trade controls on order entry
- Article 16 Real-time monitoring
- Article 17 Post-trade controls
- Article 18 Security and limits to access

trading environment, including documentation and the supporting processes around design, development, change, testing and release.

Where a firm has outsourced all or part of its algorithmic trading environment to a third-party provider, then the firm's responsibilities now extend beyond their proprietary systems to include oversight of third-party provided algorithm trading systems. This has changed how firms interact with their third-party providers, particularly the level of expectations around notification, documentation and delivery. Where long-standing relationships exist, working practices will likely need to be adapted to meet the requirements expected for regulated firms. For new relationships, the third-party provider's ability to meet these requirements are likely to be imbedded into the firm's onboarding processes.

As firms implement their own internal control polices based on regulatory requirements, the guidance within this document is intended to bridge some of the gaps that may exist between the regulated firms and their third-party providers.