

## **The Investment Association Association for Financial Markets in Europe**

### **Electronic Trading Equities Questionnaire Working Group EEA Equities Electronic Order Handling Questionnaire**

#### **Preamble:**

- This Equities Electronic Order Handling Questionnaire ('Questionnaire') has been created through the collaborative effort of the members of The Investment Association (IA) and the Association for Financial Markets in Europe (AFME) ('Associations').
- The purpose of the Questionnaire is to establish a common, non-exhaustive, framework for the request for information from clients to their electronic trading service providers.
- The scope of the Questionnaire is limited to equity/equity-like European Economic Area ('EEA') securities which are traded through a firm based in the EEA that is a regulated firm under the Markets in Financial Instruments Directive 2014/65 EU (MiFID) and associated national laws, unless otherwise specified.
- The responses refer to the securities mentioned above which are traded through electronic trading systems only.
- The information provided in response to this questionnaire is strictly confidential and for the benefit of the recipient firm and its affiliates only.
- The responses to these questions are valid for professional clients, unless otherwise specified in the specific response.
- The information is valid as of 26 April 2021.
- The liability regime for the Questionnaire is established by the Disclaimer included in Annex II, which is provided by the responding electronic trading service provider. Neither Association makes any representation or warranty, express or implied, in relation to the Questionnaire, including without limitation as to its suitability, completeness or fitness for purpose. Under no circumstances shall either of the Associations be liable for any loss or damage, whether direct or indirect, arising out of or in connection with the use of this Questionnaire.

**AFME:** represents a broad array of European and global participants in the wholesale financial markets. Its members comprise pan-EU and global banks as well as key

regional banks, brokers, law firms, investors and other financial market participants. We advocate stable, competitive, sustainable European financial markets that support economic growth and benefit society.

AFME is the European member of the Global Financial Markets Association (GFMA) a global alliance with the Securities Industry and Financial Markets Association (SIFMA) in the US, and the Asia Securities Industry and Financial Markets Association (ASIFMA) in Asia.

AFME is listed on the EU Register of Interest Representatives, registration number: 65110063986-76.

**The Investment Association:** represents investment managers. It has over 240 members who manage more than GBP 6.9 trillion for clients around the world, helping them to achieve their financial goals. Its aim is to make investment better for clients, companies and the economy so that everyone prospers.

The Investment Association is listed on the EU Register of Interest Representatives, registration number: 5437826103-53.

## QUESTIONNAIRE:

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**For the purposes of the responses to this Questionnaire, references to GS shall mean Goldman Sachs International, a UK regulated investment firm and Goldman Sachs Bank Europe SE, a German regulated credit institution.**

**A. General:**

1. Please list all countries that are covered by the responses to the Questionnaire.

GS is able to provide electronic trading capabilities to clients across all EEA countries.

For any non-EEA countries covered by this questionnaire, please refer to the list of GSET venues available at:

<https://www.goldmansachs.com/what-we-do/global-markets/gset/equities/liquidity-access/accessible-venues.pdf>

2. Are client orders advertised on the day of trading? (Y/N)

Yes, on an aggregated basis except when a client has requested their trades be excluded.

3. If client orders are advertised on the day of trading, please explain the procedures around this?

Individual client orders are not advertised. Order flow is advertised on an aggregate basis and clients may request their trades be excluded from this aggregate information.

4. In relation to how the client orders are advertised please answer Q.1 of Annex 1.

Individual client orders are not advertised.

5. Are client trades advertised on the day of trading? (Y/N)

Yes, on an aggregated basis where the client has not explicitly requested their trades be excluded.

6. If client trades are advertised on the day of trading, please explain the procedures around this?

Aggregate information on client trades are published and refreshed periodically during the day. GS has implemented internal processes which restrict the information on client trades that GS can advertise, including the ability to block certain clients' trading information where a client has requested this as well as blocks on products and/or trades based on a particular volume profile or characteristics.

7. In relation to how the firm's trades are advertised please answer Q.2 of Annex 1.

Client-specific question.

8. Do you operate tiering in determining which clients see which IOIs? (Y/N)

Yes.

9. If you operate tiering in determining which clients see which IOIs, please answer Q.3 of Annex 1.

Client-specific question.

#### **B. Best Execution and Venue Selection:**

10. Please provide a summary of your best execution policy and any further detail about how you deliver best execution.

Where GS executes transactions for clients or receives and transmits client orders to other entities for execution, GS complies with its Execution Policy. Please refer to the summary of GS's Execution Policy for Professional Clients which provides information on GS's Execution Policy available at: <http://www.goldmansachs.com/disclosures/mifid/mifid-prof-clients.pdf>

11. Do you have an in-house algorithmic trading solution, or do you utilise (white label) third-party products?

All GS trading algorithms are developed in-house.

12. If you utilise third party products please describe which ones and how they are used?

Not applicable.

13. Is your Smart Order Router (SOR) developed in-house? (Y/N)

Yes.

14. If your SOR is not developed in-house, please explain what customisation you have over its behaviour logic?

Not applicable.

15. Please provide a categorised list of all execution venues (RMs, MTFs, SIs, market makers, other liquidity providers) that your algorithmic strategies and/or SOR currently access.

Please refer to the list of EMEA GSET venues available at:  
<https://www.goldmansachs.com/what-we-do/global-markets/gset/equities/liquidity-access/accessible-venues.pdf>

16. List all the execution venues you access where you are not a member and access via a third party or via affiliates.

Please refer to the list of EMEA GSET venues available at:  
<https://www.goldmansachs.com/what-we-do/global-markets/gset/equities/liquidity-access/accessible-venues.pdf>

17. Please explain how your SOR controls the timing of child orders when sending orders to multiple venues.

The SOR strives to maximise fill rate by completing the order in one wave using head starts to synchronise each child order's arrival at the executing venue, allowing the order to the farther venue to get far enough so that when the order to the local venue arrives, the chance of our order being outrun is reduced.

18. Describe how you monitor that your SOR delivers best execution.

GS uses post-trade analysis reports to analyse how the SOR performs compared to the execution factors in our Execution Policy. These reports are reviewed and any exceptions are followed up by the GSET business supervisor. The GSET business supervisor reports periodically to the GS EMEA Global Markets Division Best Execution Committee.

19. Please describe some of the factors you consider when evaluating the likelihood of execution on a venue when choosing which venue to route orders to.

Among the factors we consider are: fill rates, queue lengths, available liquidity and latency. See question 20 for more detail. Factors may vary by SOR strategy.

20. Please describe how your SOR routes orders (including but not limited to timing, sequencing and price reversion).

Subject always to the particular instructions and/or parameters which accompany an order, the SOR is designed to be compliant with GS's internal policies and procedures on best execution, where the relevant factors taken into account include, but are not limited to, price, costs, speed and likelihood of execution.

For particular order types, the following objectives are relevant:

- **Liquidity providing:** Venues are selected with the minimum time to fill based on queue length in seconds. The queue length time is normalised and used to prioritise which venue or venues to post on

depending on the size of the order.

- **Liquidity seeking:** The order is sent to venues to minimise the parent order's average fill price, so the gross price of stock is the priority. Exchange latency and exchange fees are used to decide between venues in a price tie scenario.
- **Dark posting:** Depending on the order's intent, the SOR will either try to maximise fill rate or minimise adverse selection. When the intent is to maximise fill rate, the majority of orders get posted to all venues the SOR has access to, unless the order is small. When the intent is to minimise adverse selection, the SOR reviews a selection of factors, including short term price action ("mark outs") of the stock in the lit market before and after fills.

21. Specify how your SOR accesses internal and external sources of liquidity, and if you preference any source.

With appropriate consent, the SOR may assess the internal liquidity available from GS acting in its capacity as an SI and external SIs along with the liquidity available on other external liquidity sources, including regulated markets and MTFs. Please note, the SOR's access to liquidity sources may be restricted by applicable law, i.e. the MiFID II Shares Trading Obligation (STO). If, based on this assessment, best execution can be achieved via the liquidity available from these sources, the SOR will first source internal liquidity from GS in its capacity as an SI, and then, where necessary, source any additional liquidity from external liquidity sources.

22. Do you delegate any routing decisions to third parties?

No.

23. Do you route orders to Systematic Internalisers (SIs) and will this be house or client flow?

Yes. We route both house and client flow to SIs.

24. If you intend to connect to SIs, under what circumstances might orders be routed to external SI liquidity?

Orders may be routed to external SI liquidity when the all-in cost provided by an external SI is at least as good as or better than the lit market. The cost is calculated considering factors including but not limited to price, mark out and fill probability.

GS evaluates the quality of execution offered by the venues to which it is connected and it will only route to a venue, consistent with our best execution obligations.

25. Do you intend to connect to SIs, which you do not currently route to, by end of Q2 2018?
- Yes.
26. To what extent will clients be able to control onward routing to SIs by both your algo and SOR?
- Clients may opt out of onward routing to SIs.
27. Does your firm internally match two cash orders?
- Within the remit of applicable laws, we may be permitted to match cash orders under a trading venue's Large In Scale waiver where the orders meet the requisite large in scale size thresholds.
28. Do you provide industry standard values for tag 29, 30 and 851 for each child order execution and if not please explain why? (Y/N)
- Yes.
- Tag 29 (LastCapacity) – GS provides a value for this tag.
  - Tag 30 (LastMkt) – GS provides a value for this tag to clients who have requested it. The value returned is the MIC code of the venue where the fill was executed.
  - Tag 851 (Last LiquidityInd) – GS provides a value for this tag to clients who have requested it. GS is only able to provide a value for this tag if the venue GS executes a particular trade on provides the tag to GS.
29. If not, please explain why not?
- Not applicable.
30. Post the implementation of MiFID II, which new FIX tags will you offer or require from your clients and please confirm which ones are currently sent back to our Firm?
- A Guide to MiFID II FIX Messaging* is available upon request; this details both mandatory and optional MiFID II FIX tags.
31. If you trade with another firm's SI do you provide that MIC Code in Tag 30 rather than the generic XOFF?

Yes, the underlying SI MIC will be provided.

32. If you do not use MIC codes please explain why and provide a list of codes used.

Not applicable.

33. Which of the venues you access aggregate orders to fulfil minimum quantity.

- SIGMA X MTF
- BATS
- Chi-X

34. If you access venues which may aggregate competing orders to fulfil minimum quantity, what impact might this have on your order routing decisions?

Yes, we access venues that may aggregate orders. The SOR will not send an order to a venue for a quantity less than the minimum fill quantity requested by the client or the trading algorithm (as applicable).

35. Do clients have the option to opt out of the functionality described in Question 33, or to opt-out of the firm aggregating their orders their orders to fulfil minimum quantity?

Yes, clients are able to opt out of the above mentioned venues.

36. If clients have the option of opting out of the functionality of aggregating orders to fulfil minimum quantity, please answer Q.4 of Annex relating to how the firm is treated.

Client-specific question.

37. Does any venue you access receive or transmit order information to other destinations or participants via liquidity indications or IOIs?

Notwithstanding conditional venues, which, by their nature receive or transmit order information via liquidity indications or IOIs, where possible, GS will attempt to restrict these practices by venues.

Please refer to the list of EMEA GSET venues for all of the venues to which GS connects available at:

<https://www.goldmansachs.com/what-we-do/global-markets/gset/equities/liquidity-access/accessible-venues.pdf>



38. Please describe your minimum fill size criteria – is there a default?
- We do not have a default minimum fill size criteria. Where a client is using an algorithm, minimum fill size criteria is dependent on the algorithm’s strategy and its urgency.
39. Are your minimum fill size criteria dynamic per venue?
- Yes, clients can, on request, customise this parameter.
40. Are minimum fill size criteria customisable per client request?
- Yes, GS has a dynamic default which is a function of the average trade size. Clients can, on request, customise this parameter.
41. If minimum fill size criteria are customisable per client request, please answer Q.5 of Annex 1 in relation to how our firm is treated.
- Client-specific question.
42. Are there venues you connect to but where your firm either does not post or does not take liquidity?
- GS evaluates the quality of execution offered by the venues to which it is connected and it will only use a venue that allows GS to meet its best execution obligations.
43. Please explain the process for enabling or disabling connectivity to a venue.
- For day-to-day operational issues, GS will automatically, or with manual intervention, route away from a venue experiencing issues. If the operational issues are street-wide, then the venue notifies the street. If the issue is on the GS side, GS will normally only notify clients (where it is reasonably practicable to do so) and where GS believes that the issue would have a material impact on the execution quality available to them. This will occur on an as-needed basis, as operational issues occur.
- GS may also manually switch off a venue for a number of reasons, including if it has concerns with the quality of execution offered by that venue. The decision to add a venue is based on a combination of factors including the relative market share of a particular venue and the frequency of client requests received by GS in relation to gaining access to a particular venue. If a decision is taken to enable a new venue, it involves a gradual and careful on-boarding process as per GS’s standard production change management procedures, including review by the GS EMEA Global Markets Division Best Execution Committee. Clients are notified of the venue(s) where their orders have been executed via the tags which are sent to them.

44. Please explain how frequently connectivity to venues is enabled or disabled from the list of venues your firm trades on.

See answers to questions 42 and 43.

45. At what point would your client be notified of a venue being switched on or off? In relation to how the firm is notified, please answer Q.6 of Annex 1.

Clients will be notified as soon as possible as part of our regular communication process.

46. Can venues be switched on or off per individual client request?

Yes.

47. If you neither add nor remove venues, please explain why.

Not applicable.

48. Is your SOR contingent on primary market availability?

Yes.

49. Have you ceased trading on a venue for a period of greater than 1 month in response to execution quality concerns in the last 5 years?

Yes.

50. If you have ceased trading on a venue on a temporary or permanent basis in response to execution quality concerns in the last 5 years, please explain why.

In response to execution quality concerns GS has disabled a venue for a period of greater than 1 month in the last 5 years. GS will cease trading on venues either in response to client requests or at its own discretion. In certain cases, GS will only permit trading on certain venues for orders with particular parameters attached to them.

51. Do you in any way preference one venue over another?

As part of GS's obligation to deliver best execution and in accordance with its Execution Policy, GS may preference particular venues where accessing those venues enables GS to achieve best execution in accordance with the execution factors in the Execution Policy. This preference can result from the particular characteristics of certain orders or venues.

Please refer to question 21 for further information.

52. If you in any way preference one venue over another, please explain why.

Please refer to question 21 for further information.

53. Do you have any ownership stakes or interests in trading venues which may cause a conflict with your routing practices and decisions.

Whilst GS and its affiliates may have ownership stakes or interests in trading venues from time to time, routing decisions are, subject to particular instructions and/or parameters which accompany an order, determined in accordance with GS's Execution Policy. Please refer to Section B (Best Execution and Venue Selection) for more information.

Please note that, GS is subject to requirements regarding conflicts of interest under applicable laws. GS has implemented policies and procedures designed to identify and prevent or manage conflicts of interest arising in its business.

54. How do you monitor latency of order routing and market data connectivity to exchanges?

Order routing latency is monitored in real-time. Market data latency is currently monitored on a periodic basis, but we are working towards monitoring in real-time.

55. Please explain how latency of order routing and market data connectivity to exchanges impact routing?

The venue latency data is used as an input to venue selection for liquidity seeking order placement strategies. It is also used as an input to broker selection where GS is not an exchange member.

56. How do you ensure prompt processing of incoming electronically transmitted orders received by your desks?

Orders that are not promptly accepted or rejected are flagged in the Coverage desks' GUI.

57. Please describe how you regularly maintain analysis of client "tiers" and how often changes are made.

Not applicable.

58. Do you place any restrictions or caps on the percentage of your client flow that is eligible for routing to a particular venue?

No, we do not place any restrictions or caps on the percentage of client flow that is eligible for routing to a particular venue unless otherwise instructed by the client.

59. If you place any restrictions or caps on the percentage of your client flow that is eligible for routing to a particular venue, what are the determining factors for those restrictions or caps?

Not applicable.

**C. Algorithmic Trading:**

60. List all the algorithmic strategies currently available to the client, including material drivers, and briefly describe their purpose. Please attach brochure/provide link.

Please use the following link to access the list of GSET's current European equity trading algorithms: <http://www.goldmansachs.com/what-we-do/securities/gset/equities/algorithms-and-smart-order-router/index.html>

61. Do your algorithmic strategies reference primary or consolidated volume data?

GS's trading algorithms reference consolidated volume data by default, but clients are able to opt-in for just primary volume data on request.

62. How do you calculate consolidated volume data? What do you include and exclude?

Typically, consolidated volume includes lit, on order book, prints for regulated markets (RMs) and multilateral trading facilities (MTFs). See link for current set of venues that are included in our consolidated volume calculation: <http://www.goldmansachs.com/what-we-do/securities/gset/equities/liquidity-access/accessible-venues.pdf>

63. Do you offer trading algorithm customisation? (Y/N)

Yes.

64. Do high-touch traders use the same trading algorithms listed under Question 60 when executing client orders? (Y/N)

Yes.

65. If your high-touch traders do not use the same trading algorithms listed under Question 60 when executing client orders, please elaborate the differences.

Not applicable.

66. Without client customisation request, do any of your algorithms in any way behave differently based on commission rates or the client? (Y/N)

No.

67. Within algorithmic trading do you offer different speeds to market depending on the client type, commission paid or volume traded? (Y/N)

No.

68. If yes, please explain.

Not applicable.

69. Please describe the inbuilt controls that would protect the client from external negative events (flash crash, fat-fingers by 3<sup>rd</sup> parties etc.) and how these differ between strategies/material drivers (internal negative events covered in risk & controls)

GS has a number of controls in place to protect GS client electronic order flow from external negative events. Examples of GS's checks and controls include but are not limited to the following:

- Pre-trade notional value checks
- Pre-trade price checks
- Intra-day price move checks
- Cumulative activity checks
- Emergency shutdown procedures
- Software change management policy and procedures
- Surveillance program to monitor for potential market abuse

70. Does your firm support inbound and outbound conditional order types? (Y/N)

Yes.

71. If your firm supports inbound and outbound conditional order types, in what circumstances are they used?

Algorithmic orders with a dark liquidity seeking instruction may interact with conditional liquidity venues via GS' BlockFinder conditional liquidity router.

72. Explain the process for maintaining and improving an algorithmic strategy or SOR's performance, including how regularly you make changes to the variables/factors driving the algorithmic strategy?

Improving execution quality for trading algorithms and the SOR is an iterative process, for which there are four key components:

**Measure:**

- Establishing metrics to quantify execution quality
- Monitoring performance based on these metrics

**Analyse:**

- In-depth study of execution behaviour
- Real time and historical basis
- Identifying opportunities to improve performance

**Review:**

- Proposing and justifying suggested changes
- Periodic review of performance

**Change:**

- Implementing new behaviour
- Run experiments
- Roll out change

As part of the above process, GS frequently releases new code for its trading algorithms and SOR. Execution quality metrics are reviewed on a regular basis.

73. Explain the process for communicating material changes of variables / factors driving the algorithmic strategy / SOR to clients. In which circumstances would you communicate changes?

GS would consider a material change to be any modification to existing algorithms or smart order routing logic that would significantly change the general intent of the strategy. Any changes meeting the above criteria would be formally documented and communicated to existing clients.

**D. Liquidity Sources:**

74. Do you operate an MTF? (Y/N) (If not, please go to Q. 83)

Yes, GS operates SIGMA X MTF and SIGMA X Europe MTF, collectively referred to in this document as "SIGMA X". SIGMA X MTF is a UK-based MTF, operated by Goldman Sachs International Bank, and SIGMA X Europe MTF is a France-based MTF, operated by Goldman Sachs Paris Inc. et Cie (GSPIC), both affiliates of the GS Group. SIGMA X operates a non-displayed book pursuant to the reference price waiver under MiFID II/MiFID II as on-shored in UK legislation and a periodic auction book on both MTFs, each on an operationally

segregated basis. GSI and GSBE are both trading members of the UK and French MTF respectively and the GSET offering includes access to SIGMA X via these trading members.

75. How does your MTF measure the best bid/offer and any other reference price or benchmark?

SIGMA X will form the PBBO by taking into account prices displayed by the primary trading venue of each security (i.e. the most relevant market in terms of liquidity or market of first listing as applicable). In the case of securities which are dual-listed, with one listing within the EEA and one listing outside of the EEA, the relevant market will be the EEA market. In the event that the price of a security is not available from the relevant primary trading venue, trading on that security will be halted on SIGMA X.

76. Please describe the governance framework for monitoring your MTF.

SIGMA X is operated as an independent business from the Goldman Sachs Equities Franchise with its own separate management structure. SIGMA X outsources its technology and operations support to Euronext Technologies SAS. The operation of SIGMA X is overseen by the SIGMA X Chief Operating Officer with the guidance of the Oversight Group. The Oversight Group consists of five senior representatives from various areas of Goldman Sachs including the global markets, operations, compliance and legal divisions. Further details can be found in the SIGMA X MTF and SIGMA X Europe MTF Rulebooks and Participant Manuals.

77. Can your clients collocate close to your MTF?

SIGMA X is hosted in ICE's European Data Centre, along with other key liquidity venues. Although GSIB and GSPIC do not offer co-location services directly to trading members of SIGMA X, it is possible for trading members to co-locate with SIGMA X by entering into the necessary commercial arrangements directly with the network and data centre provider. Details can be found at <https://gset.gs.com/Sigmaxmtf/InfoParticipants>.

78. If a client can collocate close to your MTF, what are the advantages?

As a general matter, co-location may offer certain advantages including for example reduced latency. Trading members should refer this question to the ICE European Data Centre for further guidance.

79. Please list all order types used on your MTF?

For the Non-Displayed Book, the only order type available is a Peg Mid Order to buy or sell at the midpoint of the PBBO, with or without a limit price.

For the Auction Book, the available order types are Peg Bid/Mid and Offer to buy or sell at the Peg Bid/Mid and Offer of the PBBO respectively, with or without a limit price. In addition, Limit orders are permitted.

80. How does your MTF's minimum order size functionality work?

SIGMA X does not offer a minimum order size functionality, but a Minimum Acceptable Quantity ("MAQ"), which a member may wish to specify for an order. If a member enters an order on SIGMA X with a MAQ specified, that MAQ will be persistent during the whole life of the order. A MAQ will only execute if opposing orders, in aggregate, meet the MAQ specified by the member. By way of example, where member A specifies a minimum quantity of 100 with respect to an order to buy 500 shares, in the event that member B sends an order to sell at the same price for 50 shares, member A's order would not cross with member B's order because member B's order of 50 shares is less than member A's minimum quantity of 100. When a MAQ order is partially filled, if the remaining quantity is lower than the initial MAQ, the MAQ will be reset to the remaining order quantity. For example, if the MAQ is set at 200 shares and the order submitted in the system is for 900 shares, the order may achieve partial execution against another order for 800 shares, at which point the MAQ will be reset at 100 shares.

81. Are you able to apply restrictions to the trading of a participant in your MTF as a result of execution quality concerns? (Y/N)

Yes.

82. If yes, please explain how?

Restrictions may be applied in accordance with the SIGMA X MTF and SIGMA X Europe MTF Rulebooks. Per section 13.1 (iv) Market Conduct of the SIGMA X MTF and SIGMA X Europe MTF Rulebooks, a participant must not engage in any type of behaviour which may, in the operator's sole determination, adversely affect fair and orderly trading on SIGMA X or harm the integrity or reputation of SIGMA X, including but not limited to impacts to the overall execution quality of transactions for participants.

***For firms registered as/connecting to SIs (other firms please move to Section E):***

83. What is your SI's quoting policy for price and size?

Our two equity systematic internalisers are operated in Europe by GSBE and in the UK by GSI. In line with our "Systematic Internaliser Commercial Policy – Equity/Equity-like Instrument" and in accordance with applicable laws, we will provide firm quotes to reflect prevailing market conditions when dealing in sizes up to SMS for the relevant instrument.



These policies can be found on the following GS website:

<https://www.goldmansachs.com/disclosures/eq-si-policy.pdf>

84. If you operate an SI, how do you manage any conflicts of interest in relation to your SI?

GS is subject to requirements regarding conflicts of interest under applicable law. GS has implemented policies and procedures designed to identify and prevent or manage conflicts of interest arising in its business.

Decisions as to whether an order fill is from GS (acting in its capacity as an SI) versus any other liquidity source are, subject to particular instructions and/or parameters which accompany an order, determined in accordance with GS's Execution Policy. Please refer to Section B (Best Execution and Venue Selection) for more information.

85. What information (e.g. including but not limited to client name, side, size, price, instrument, limit) do you disclose to your SI?

At the point of execution, we disclose side, size, price and instrument only after the execution takes place. For partially executed orders, only the filled portion of the order is disclosed.

86. Is this information made available to clients? (Y/N)

Yes.

87. Do you monitor and disclose fill, firm up and/or hit rates internally and/or externally?

Yes. As part of our best execution periodic reviews, we monitor fill rates and hit rates internally and externally on client request.

88. If you do monitor and disclose fill, firm up and/or hit rates internally and/or externally, please answer Q.7 of Annex 1.

This information is provided on request.

89. Do you provide customised tags alongside the MIC code in Tag 30 to identify the type of liquidity our client orders have interacted with?

When interacting with external SIs we provide transparency of the underlying liquidity provider through tag 30. For our own SIs, we currently provide further classification of the type of principal liquidity interacted with.

**E. Transaction Cost Analysis / Post-trade Analysis:**

90. Do you have capability to offer TCA? (Y/N)  
Yes.
91. Can TCA be provided in real time? (Y/N)  
Yes.
92. Do you provide post-trade analysis detailing the venues you have traded with? (Y/N)  
Yes.
93. If you do not provide post-trade analysis detailing the venues you have traded with, please explain why not?  
Not applicable.

**F. Client Confidentiality:**

94. Which part of the firm is tasked with monitoring the electronic order flow?  
Both the GSET business (including the first line risk monitoring support) and the GS compliance team monitor electronic order flow. The business monitors order flow on a real-time basis and compliance monitors on a T+1 basis via the use of a variety of surveillance reports.
95. Do you execute orders with any affiliates? If yes, what additional controls do you have in place to ensure conflicts are managed?  
GS uses affiliate brokers to execute transactions in certain overseas jurisdictions, in which case GS is the client of the affiliate broker. Our decision to utilise an affiliated broker to execute an order is based on best execution considerations as would be the case for any unaffiliated broker.
96. What information (e.g. including but not limited to client name, side, size, price, instrument, limit) do you disclose to external SIs?  
To external SIs, we disclose side, size, price and instrument.

97. Please describe what controls, processes and procedures are in place to ensure client anonymity?

Where a client has a specific requirement around client anonymity, the firm has procedures in place designed to accommodate this. Where GS receives a request to do so from a client, it will internally abbreviate or code that client's Client ID. Separately, access to GSET client order information is limited as described in questions 96, 98 and 100.

98. Which departments of your firm have the ability to see orders (and related execution information) traded via the electronic trading channel?

Generally, overall access to order information is governed by GS's "need to know" policy, which is applicable to the personnel of GS and states that only those employees who have a need to know the information to perform their duties and carry out the purpose(s) for which the information was provided may have access to the information. Accordingly, employees with access to a system in which order information resides should only refer to it if prompted to do so in connection with their trade processing-related or firm regulatory responsibilities.

Personnel within the following GS Global Markets Division teams have access to GSET client order information:

- GSET business
- Compliance
- Strategists
- Technology
- Operations

Please see question 99 and 100 for further information.

99. Can any other desks see client execution order flow which is not routed to that desk for execution? (Y/N)

Yes.

100. If other desks see client execution order flow which is not routed to that desk for execution, what can they see and what is the rationale?

Where written client consent has been received, certain non-GSET trading desks are able to see GSET client execution order flow.

101. Are there any controls in place to restrict cash traders acting/trading on client order flow? (Y/N)

Yes.

102. If there are no controls in place to restrict cash traders acting/trading on client order flow, how is this policed?
- Not applicable.
103. How is permission monitored to ensure that when an employee changes their role within your firm, their privileges are reviewed as well?
- Once an individual's role is changed in GS's internal systems, this prompts a review of the individual's existing permissions. An individual will only retain their existing permissions if the relevant internal approvals are received.
104. If someone leaves the department are all their system permissions automatically removed? (Y/N)
- Yes.
105. Are Client ID's internally abbreviated or coded for anonymity? (Y/N)
- Yes.
106. If Client ID's are internally abbreviated or coded for anonymity, please answer Q.8 of Annex 1.
- GS will internally abbreviate or code Client IDs where requested to do so by a client. The general position is that specific client flow visibility is restricted to personnel working for those desks with responsibility for coverage of a client and members of the Compliance, Strategist and Technology teams who support those desks.
107. Is any of your clients' information accessible to parts of your operations based outside the EEA?
- Yes.
108. What is your firm's approach to communicating internally and/or externally, aggregated information about client electronic orders and trading activity intra-day, whether via reports or via data feeds?
- Anonymized and aggregated client information may be included in internal and/or external reporting, except in cases when the client has specifically requested their information be excluded.
109. How does your firm determine which subset of clients or internal desks/individuals receive this data?
- All clients receive the same information externally. Internal desks/individuals receive this data on a need-to-know basis.

**G. Risks and Controls:**

110. Please describe the team structure for electronic trading including roles and responsibilities.

The GSET coverage team services GSET client needs. The GSET coverage team works alongside the Technology and Strategist teams that oversee the performance of our DMA, SOR and algorithmic offering, in addition to leveraging client feedback to ensure our ability to accurately tailor custom solutions to satisfy client requests. From algorithm selection to reducing trading cost, GSET is committed to finding the solutions that best suits our clients' specific trading needs. The GSET team takes a metrics-driven approach to evaluating quality of execution, working closely with our clients to develop further customisations to fit unique investment objectives.

111. Please specify who is our firm's primary contact for algorithmic trading should we need to contact them (name, phone number and email address).

Client-specific question.

112. What standard hard reject checks do you carry out on client orders?

GS may implement a number of electronic filters on orders entered by clients on any electronic trading system maintained by GS or to which access is facilitated by GS for the purpose of implementing credit limits, position limits or other limits on GSET clients' trading activities. These filters, among other things, analyse the economic and potential market impact of the order and may consider the size, price or any other relevant attributes as well as compliance with GS's internal restricted list and all other applicable rules and regulations. Any limits imposed by GS are solely for the protection of GS and GS does not have responsibility for monitoring or ensuring its clients' compliance with any client-imposed internal limits or with applicable law or regulation.

113. What standard soft hold checks do you carry out on client orders?

GS has risk management controls and supervisory procedures reasonably designed to (1) systematically limit the financial exposure that could arise as a result of market access, and (2) ensure compliance with all regulatory requirements that are applicable in connection with market access. Examples of GS's checks and controls include but are not limited to the following:

- Notional value checks
- Order quantity checks
- Intra-day price move checks

114. If any standard soft hold checks are carried out on client orders, please answer Q.9 of Annex 1.

Client-specific question.

115. Please describe the fair value mechanics built into your algorithmic strategies/SOR?

The GSET algorithms have fair value metrics built in to them. The algorithms evaluate the current spread and mid-price relative to those metrics to determine the attractiveness of the near touch, mid (for dark) and far touch price points. The SOR uses current market prices as part of its routing decision-making process.

## ANNEXES

### ANNEX I – Client Specific Questions

*The information included in this Annex is related to the trading activity of the specific client*

1. Further to Q.4, Section A, please explain how our firm's orders are advertised on the day of trading.
2. Further to Q.7, Section A, please explain how our firm's trades are advertised on the day of trading.
3. Further to Q.9 of Section A, if you operate tiering in determining which clients see which IOI's, please confirm which tier is our firm currently residing in?
4. Further to Q.36 of Section B, if clients have the option of opting out of functionality of aggregating orders to fulfil minimum quantity, please confirm how our firm is treated.
5. Further to Q.41 of Section B, if minimum fill size criteria are customisable per client request, please confirm how our firm is set up.
6. Further to Q.45 of Section B, if your firm switches off an existing venue or starts routing to a new one, how will our firm be informed?
7. Further to Q.86 of Section D, if your firm operates an SI and monitors, fill, firm-up and/or hit ratios, please confirm whether this information is provided to our firm, how and at what frequency.
8. Further to Q.104 of Section F, if Client ID's are internally abbreviated or coded for anonymity, please confirm how our firm's name appears in your systems?
9. Further to Q. 114 of Section F, please list any soft hold checks you have applied to our order flow.

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### ANNEX III – Abbreviations

<b>Abbreviation</b>	<b>Explanation</b>
AFME	The Association for Financial Markets in Europe
EEA	European Economic Area
FIX	Financial Information eXchange Protocol
IA	The Investment Association
IOI	Indication of Interest
MIC Code	Market Identifier Code
MiFID II	Markets in Financial Instruments Directive II
MTF	Multi-Lateral Trading Facility
RM	Regulated Market
SI	Systematic Internaliser
SOR	Smart Order Router
TCA	Transaction Cost Analysis
XOFF	Venue identification code used to indicate a transaction is made off venue