London Stock Exchange

London Stock Exchange

MIT201 - Guide to the Trading System

Issue 13

effective from 2 November 2015

London Stock Exchange Group

London Stock Exchange

Disclaimer

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1.0 Introduction

London Stock Exchange is committed to continually enhancing its markets. UK cash equity markets migrated to MillenniumIT's multi-asset class, ultra-low latency platform, Millennium Exchange, on 14 February 2011. Since that time we have continued to improve performance and launched new services such as Sponsored Access, providing non-members a direct technical connection to our order books under the trading codes of a sponsoring member firm; and the Closing Price Crossing Session.

Release 8.7, launched on 2 November 2015, is the latest in this line of development and the enhancements can be summarised as follows:

- **SETS enhancements for Mid Price Pegged Orders**
    - Introduction of Minimum Execution Size (MES) for pegged orders
    - Introduction of Immediate or Cancel (IOC) and Fill or Kill (FOK) time in force for pegged orders
    - A pegged order with a price outside of the range of its limit price now becomes inactive instead of expiring. The order will then be reactivated if the mid-price moves back to within range of the limit price
- **SETS enhancements for less liquid securities**: Introduction of Minimum Quantity at Touch for selected SETS equity securities outside of the FTSE 350 Index
- **SETSqx enhancements**
    - Re-introduction of SETSqx opening auction
    - Improvement to the visibility of orders in SETSqx **without** market makers model. Orders will now be publicly visible for up to 90 days, rather than just during the 5–10 minute auction calls as is the case on SETSqx with market makers
    - Removal of ATC (At the Close) Time in Force
- Sponsored Access enhancements, including email and Sponsor portal warning alerts on percentage of Maximum Gross Consideration utilised
- Removal of Price Differential field from Execution Reports and Trade Capture Reports

1.1 **Purpose**

The purpose of this document is to provide participants with:

- a business overview of the Millennium Exchange trading system for London Stock Exchange
- a high level technical overview of the following areas:
    - customer facing trading interfaces to Millennium Exchange trading system (both FIX 5.0 and Native);
    - user and market configuration;
    - disaster recovery; and
- generic operation of the Trading Services provided by Millennium Exchange.

The detailed operation of each Trading Service is governed by the specific configuration of Millennium Exchange and summarised in the ***Millennium Exchange Business Parameters*** document. Both this document and the Business Parameters Document should be read in conjunction with the Rules of the London Stock Exchange.

Technical details of the information system and the approach to customer testing are covered in the *Technical Parameters* document as well as the associated Technical Specifications and Release Notes.

1.2 **Relevant London Stock Exchange communication channels**

- **Rules of the London Stock Exchange**

  The full current Rules of the London Stock Exchange in force can be found at:

  www.londonstockexchange.com/traders-and-brokers/rules-regulations/rules-regulations.htm

  Changes to the Rules of the London Stock Exchange and other key regulatory announcements are made by Stock Exchange Notice.

- **Stock Exchange Notices**

To sign up to e-mail notification of future Stock Exchange Notices and view the library of previous ones please see:

www.londonstockexchange.com/traders-and-brokers/rules-regulations/change-and-updates/stock-exchange-notices/2014/home-2014.htm

- **Service Announcements**

Live Service changes and other trading and information product news is notified by Service Announcements. To be added to the Service Announcement distribution list, please email: **msu@lseg.com**

To view the library of previous Service Announcements please see:

www.londonstockexchange.com/products-and-services/technical-library/service-announcements/service-announcements.htm

- **Live Service Portal**

The current system status of London Stock Exchange's services are displayed on its Live Service Portal. This is the mechanism for London Stock Exchange communicating any market intervention actions it takes as result of a service interruption. Participants can register to receive both SMS text and e-mail notification of status changes of the portal which can be found at:

http://liveservice.londonstockexchangegroup.com/en/

- **Trading Services webpage**

More details of London Stock Exchange's Trading Systems, including where the latest versions of this document and the ***Millennium Exchange Business Parameters*** document can be found:

www.lseg.com/tradingservices

- **Trading database tools**

To help you keep your trading database synchronised on a real time basis, you may wish to subscribe to either the Datasync Email Service or the Datasync Daily Tradable Instrument Report (DTI). To find out more please see:

www.lseg.com/areas-expertise/post-trade-services/matching-and-reconciliation/unavista-solutions/unavista-data-solutions/datasync

- STX: 33009
- Telephone: +44 (0)20 7797 3009
- e-mail: **unavistadatasolutions@lseg.com**

1.3 Readership

This document outlines the Trading Services available on Millennium Exchange. When read in conjunction with the message specifications it is intended that these documents provide the information that participants require to develop to these services.

This document is particularly relevant to trading, compliance and technical staff within London Stock Exchange's member firms and software providers.

1.4 Document series

The current series of documents are set out below:

- **Trading**
    - MIT201 – Guide to Trading System (this document)
    - MIT202 – Trading Gateway (FIX 5.0)
    - MIT203 – Native Trading Gateway Specification
    - MIT204 – Post Trade Gateway (FIX 5.0)
    - MIT205 – Drop Copy Gateway (FIX 5.0)
- **Market Data**
    - MIT301 – Guide to Market Data Services
    - MIT303 – Level 2-MITCH Specification
    - MIT304 – Regulatory News Service Specification
- MIT401 - Reference Data Service Specification
- MIT501 - Guide to the Customer Testing Services
- MIT502 - Guide to Application Certification
- MIT503 - Certification Report
- MIT601 - Guide to Trading Services Disaster Recovery
- MIT701 - Guide to Sponsored Access
- MIT702 - Optimised Data Delivery Launch Guide
- MIT801 - Reject Codes
- MIT1001 – Connectivity Guide
- Millennium Exchange Business Parameters
- Trading Technical Parameters
- Market Data Technical Parameters
- FTSE Indices Disseminated by Millennium Exchange
- **Group Ticker Plant**
    - GTP001 – Product Guide
    - GTP002 – Technical Guide
    - GTP003 – Statistics Guide
    - GTP004 – Parameters Guide
    - GTP005 – Testing Services Guide
    - GTP006 – External Sources Guide
    - GTP007 – GTP Lite Guide

These documents can be found at:

www.londonstockexchange.com/products-and-services/technical-library/millennium-exchange-technical-specifications/millennium-exchange-technical-specifications.htm

This series does not override or supersede the Rules of the London Stock Exchange, the AIM Rules or Admission and Disclosure Standards.

1.5 **Document history**

This document has been through the follow iterations:

Issue	Date	Description
1.0 to 7.2	1 February 2010 to 8 February 2011	9 versions ahead of launch
7.3	14 February 2011	Launch of Millennium Exchange
8.0	26 September 2011	Introduction of the electronic Order book for Retail Bonds
9.0	30 April 2012	Update for MIT901 Guide to Millennium Exchange Functional Release
10	26 November 2012	Updated for: - Millennium Exchange 26 November 2012 Release - Introduction of International Board
11	18 November 2013	Amended to reflect Release 8 Millennium Exchange enhancements.
12	15 September 2014	Amended to reflect Release 8.5 Millennium Exchange enhancements.
12.1	17 November 2014	Rebrand of full depth marker data protocol to Level 2-MITCH.
12.2	1 April 2015	Minor text amendments
12.3	11 May 2015	Introduction of Cross Orders and Block Trade Facility to Exchange Traded Funds and Exchange Traded Products and some other minor clarifications
12.4	22 June 2015	Withdrawal of International Board
13	2 November 2015	Amended to reflect Release 8.7 Millennium Exchange enhancements

1.6 **Enquiries**

Technical Account Management

For functional queries, client on-boarding and technical advice about the Millennium Exchange:

- Telephone: +44 (0)20 7797 3939
- e-mail: **londontam@lseg.com**

Client Support Team

For incident and problem management (Live Service and CDS):

- Telephone: +44 (0)20 7797 1500
- e-mail: **support@lseg.com**

Market Access

Enquiries in connection with user setups, certification testing and connectivity testing e-mail: **marketaccess@lseg.com**

Membership Team

For enquiries relating to trading profile amendments and clearing & settlement static data

- Telephone: +44 (0)20 7797 1900
- e-mail: **membership@lseg.com**

Trading Services enquiries

Enquiries in connection with London Stock Exchange's business operation of its trading services:

- Telephone: +44 (0)20 7382 7650
- e-mail: **clients@lseg.com**

Market Supervision

Enquiries in connection with real time trading issues and oversight of the market's operation:

- STX: 33666 (option 2)
- Telephone: + 44 (0)20 7797 3666 (option 2)

Market Operations

Enquiries in connection with deleting live orders from Millennium Exchange and market maker registration administration:

- STX 33666 (option 1)
- Telephone: + 44 (0) 20 7797 3666 (option 1)
- e-mail: **msu@lseg.com**

2.0 Customer Interfaces

2.1 **Overview**

The following interfaces and protocols are available to participants (illustrated in Figure 1)

- Trading Interface
  Order / quote entry and immediate confirmation of automated trades

- Post Trade Interface
  'Enriched' trade confirmation of automated trades (including cancellations)[1]
  Off Book Trade Reporting
  Own Trades Book Download (OTBD)

- Drop Copy Interface
  'Copy To' functionality
  Own Order Book Download (OOBD)

- Reference Data Service

All of the above customer interfaces are on FIX 5.0 SP2 with the exception of Reference Data Service[2] and the fixed width Native interface for the Trading Interface only (N.B. Firm Quote entry is not supported on Native). Participants will connect to each interface via a FIX or native Gateway, depending on the functionality they require.

- FIX Trading Gateway
- Native Trading Gateway
- FIX Post Trade Gateway
- FIX Drop Copy Gateway

[1] Including any Exchange initiated cancellations
[2] Is supported via FTP and SFTP

Figure 1 – Customer Interfaces

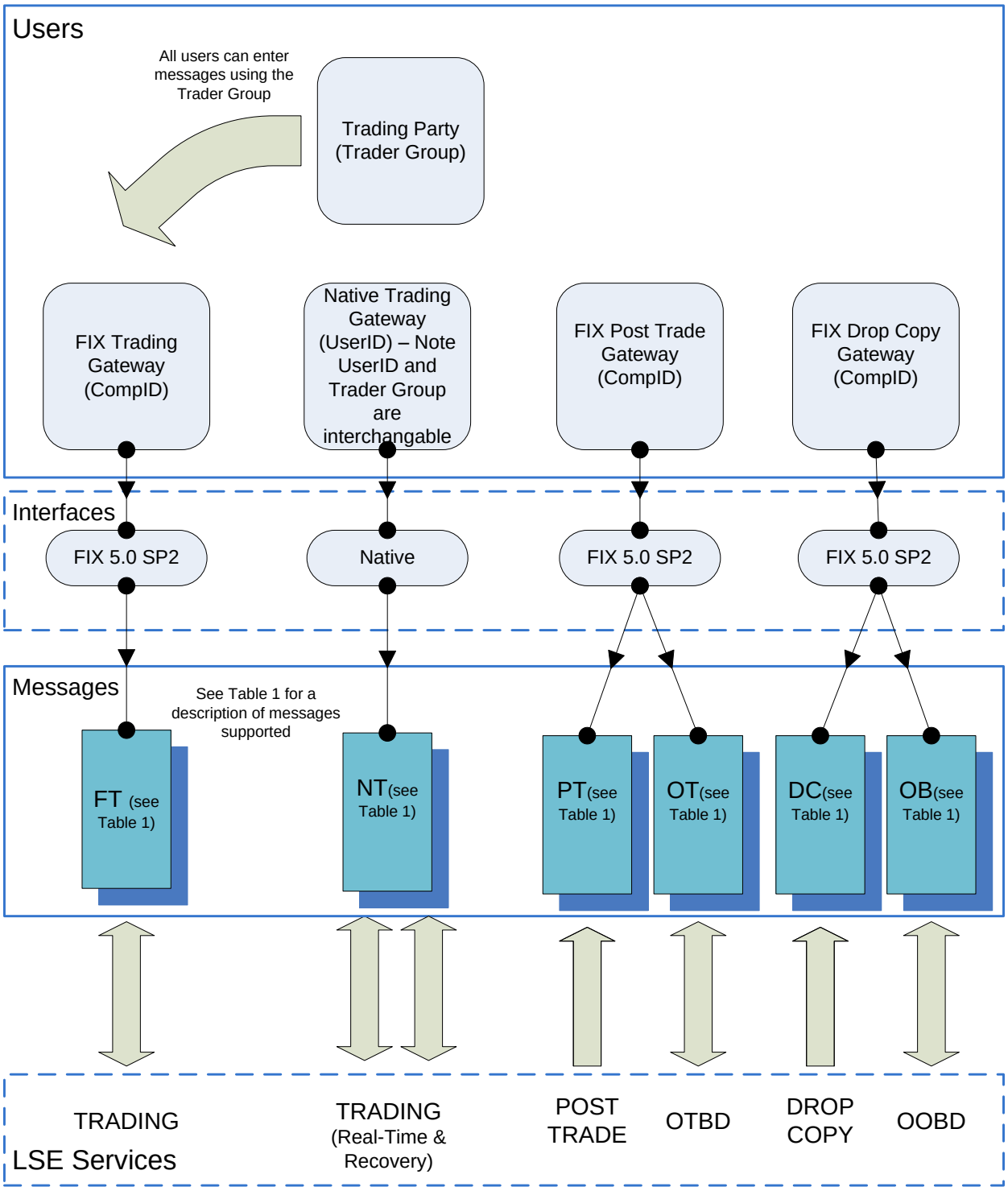


Table 1 – Functional messages supported

Interface	Message Group	Direction	Functional messages supported
FIX Trading	FT	Inbound (to London Stock Exchange)	D - New Order Single F - Order Cancel Request q - Order Mass Cancel Request G - Order Cancel/Replace Request S - Quote Z - Quote Cancel s - Cross Order Message u - Cross Order Cancel Request
FIX Trading	FT	Outbound (from London Stock Exchange)	8 - Execution Report 9 - Order Cancel Reject r - Order Mass Cancel Report AI - Quote Status Report b - Mass Quote Acknowledgement
Native Trading[3]	NT	Inbound	D - New Order Single F - Order Cancel Request q - Order Mass Cancel Request G - Order Cancel/Replace Request S - Quote M - Missed Message Request

[3] Note – for consistency FIX message identifiers are used on the Native Interface. However, format and content of the messages are different.

Interface	Message Group	Direction	Functional messages supported
Cont'd from above			C - Cross Order Message H - Cross Order Cancel Request
Native Trading	NT	Outbound	8 - Execution Report 9 - Order Cancel Reject r - Order Mass Cancel Report N - Missed Message Request Acknowledgement P - Missed Message Report
Post Trade	PT	Inbound	AE - Trade Capture Report
Post Trade	PT	Outbound	AR - Trade Capture Report Acknowledgement
Post Trade	OT	Inbound	AD - Trade Capture Report Request BW - Application Message Request
Post Trade	OT	Outbound	AQ - Trade Capture Report Request Acknowledgement AE - Trade Capture Report BX - Application Message Request Acknowledgement
Drop Copy	DC	Outbound	8 - Execution Report
Drop Copy	OB	Inbound	AF - Order Mass Status Request
Drop Copy	OB	Outbound	8 - Execution Report

2.2 **Message workflow**

Participants must use the Trading Interface (FIX or native) to send order and quote messages to Millennium Exchange via configured Users. In response, Millennium Exchange will send Execution Reports over the interface used giving the status of the order / executable quote.

Should a trade occur then the order/ quote status will be immediately updated by an Execution Report[4] sent from the Trading Interface over the participant connection that sent in the order / quote. In addition to order status the Execution report will summarise the details of the trade and provide the following information:

- Side
- Trade Quantity
- Trade Price
- Counterparty to the Trade
- Trade ID
- Transaction Time
- Aggressive / Passive Indicator

In addition, an 'enriched' Trade Capture Report will be sent via the Post Trade Interface. This will include the trade details specified in the Execution Report as well as the following information:

- ISIN
- Matching Type (Regular Trading or Auction)
- Clearing Type (is the trade cleared or not)
- Novated Indicator[5]

This means that participants will receive two messages notifying them of the trade. They will be free to choose which message to act on before submitting the next message. For the implications of this on the recovery model please see Section 10.

Participants will be able to link the Execution Report and Trade Capture Report using either the ExecID or ClOrdID tags.

[4] Note – for Executable Quotes two Execution Reports will be sent – one for each side of the Quote

[5] Indicates if a trade is internalised or not

Participants should note:

- In normal circumstances the Trade Capture Report will be delivered after the Execution Report.
- Execution Reports will be sent to the CompID that sent the order or quote
- Customers have the option to cancel at firm level so a "master" CompID could cancel all orders entered for the firm by all other CompIDs.
- A cancel on disconnect facility has been provided as a means of managing orders if a session is lost. See Section 3.7 Cancel on disconnect / logout for more details.
- A Post Trade / Drop Copy User can be configured to receive all Trade Capture Reports / Execution Reports for the Firm, or selected CompID / UserID. Additionally, a Post Trade User can also be configured to receive all Trade Capture Reports for selected CompID / UserID under a **different** Firm.
- Customers are recommended to have a separate connection to the Post Trade Gateway for Off Book Trade Reporting, Real Time Trade Capture Reports and the OTBD service.
- Where a customer is using 'Copy To' functionality, a separate connection to the Drop Copy Gateway will be required over and above that used to support the OOBD service.

2.3 **Time synchronisation**

As per the FIX standard, all times on FIX trading messages must be specified in UTC on all interfaces. Customers are recommended to use the Sending Time in the FIX logon message sent by Millennium Exchange to synchronise system clocks.

2.4 **Reference Data Service**

Reference data is managed by the Reference Data Service that provides instrument reference data to participants in a 'flat file' format and available via FTP/SFTP. Full details of the interface are specified in MIT401 – Guide to Reference Data Services.

In addition to the flat file a subset of reference data is available via the Market Data feed each morning. Full details are provided in 'MIT301 – Guide to Market Data Services' and 'GTP001 – Product Guide'.

2.5 **Technical details**

Technical details of all interfaces are provided in the following documents:

- MIT202 - Trading Gateway (FIX 5.0)
- MIT203 - Native Trading Gateway Specification
- MIT204 - Post Trade Gateway (FIX 5.0)
- MIT205 - Drop Copy Gateway (FIX 5.0)
- MIT401 - Guide to Reference Data Service

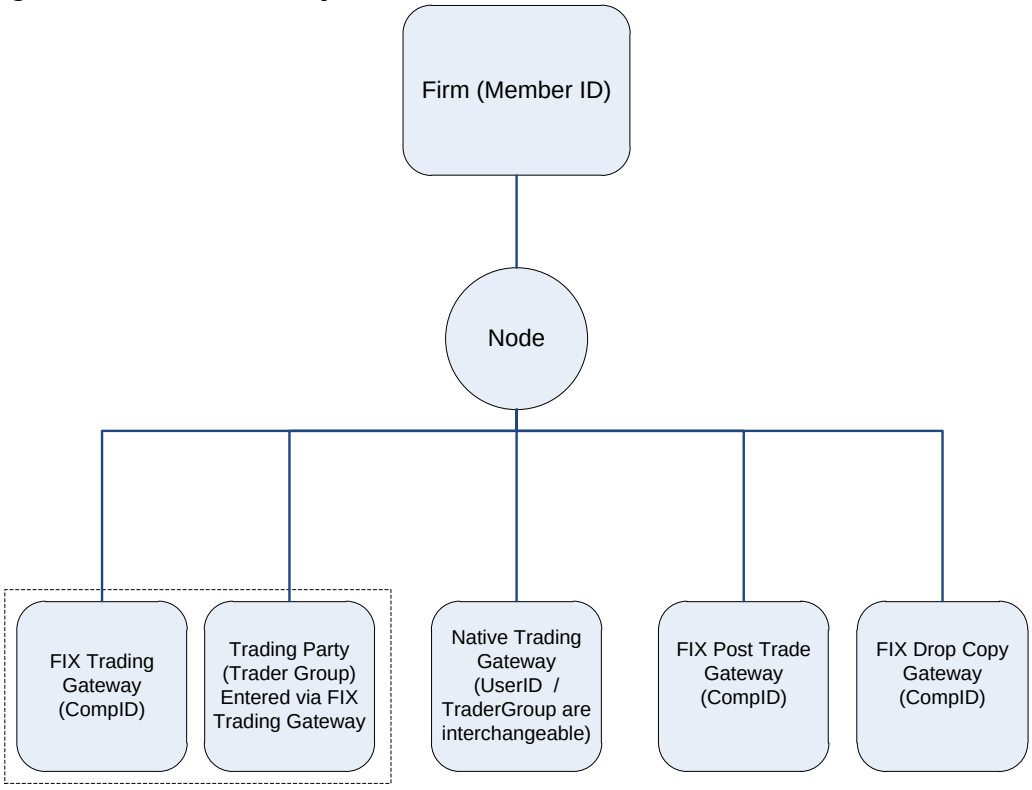
3.0 User Configuration

Millennium Exchange allows a flexible approach to be taken to the configuration of participants. London Stock Exchange works closely with customers to agree a configuration that meets their requirements but the following sections are provided for background. Details of how self executions can be excluded from trading (Self Execution Prevention) and clearing & settlement (SETS Internalisation) are also provided.

3.1 **Structure**

Generically, there is a 3-tier hierarchy consisting of Firm, Node and User. Each User will have an associated Role.

Figure 2 – User hierarchy



Each level in the hierarchy is described in the following sections.

3.2 **Firm**

A Firm represents the highest level when depicting a participant and is intended to represent the membership under which business is routed to London Stock Exchange. The Firm is identified by a unique Member ID. No technical or business enablement will be held against a firm and there is a one to many relationship between Firm and Node.

3.3 **Node**

A Node represents a logical grouping of Users (see below).

A Node by itself has no technical meaning but allows customers a degree of further classification/segmentation within their business, for example a firm with different clearing arrangements can segment its business accordingly.

Once a Node is created all Users falling under that Node inherit the same configuration. Firms are able to create new NodeIDs to suit their business requirements.

3.4 **User**

A User represents a generic business or technical enablement, such as a trading desk or a FIX Gateway. The exact type of User is defined by the associated Role. The same User can only be configured under one node. The User can only have one of the Roles outlined below.

3.4.1 TraderGroups for FIX Connections

This Role enables the User as a 'Trading User' which represents an identifiable trading entity such as trading desks, automated trading applications or individuals.

Specific enablements such as the ability to enter orders or the ability to market make will be controlled by attributes of the Trader Role associated with the TraderGroup.

TraderGroups do not connect directly to Millennium Exchange. One or more FIX CompID must be configured which then send the appropriate trading messages to London Stock Exchange on behalf of TraderGroups. Participants should note that all FIX Users under a particular node can send messages on behalf of all TraderGroups under the same node. Likewise a FIX User under one particular node cannot send messages on behalf of TraderGroups under other nodes.

Participants can identify orders using TraderID[6] but no permissions or configuration will be held against this identifier. TradeID will be returned in Execution Reports and Trade Capture Reports.

3.4.2 TraderGroups for Native connections

Participants should note that Users on the native interface are connected and identified via UserIDs. Existing TraderGroups can be used interchangeably as UserIDs for all Native Trading connections.

Native UserIDs are used to denote a single connection to Millennium Exchange and as such individual User/TraderGroups are not transferrable across multiple connections.

Member firms are advised that TraderGroups must follow a specific structure:

- Either eight or eleven characters
- Alphanumeric only
- They must not end in 1234 or trailing XXXXs
- We encourage member firms to utilise trader groups that relate wherever possible to the company name

This structure ensures that TraderGroups pass through trading and post trade validation.

[6] Specified in the FIX message using Tag 448 – PartyID with Tag452 – Party Role set to 12

Any new requests for TraderGroups will be validated by London Stock Exchange.

Any questions, please contact Membership Team on +44 (0) 20 7797 1900 or **membership@lseg.com**

3.4.3 FIX Connection Users

These Roles enable the user as a 'FIX User' which represents a discrete FIX connection to a specified Millennium Exchange FIX Gateway. Each of the FIX Gateways will have a Role associated with them to enable the following User Types to be defined.

- FIX Trading Gateway User
- FIX Post Trade Gateway User – Real Time Enriched Trade Reports and Off Book Trade Reporting
- FIX Post Trade Gateway User – Own Trade Book Download
- FIX Drop Copy User – Real Time Execution Reports
- FIX Drop Copy User – Own Order Book Download

Each FIX User will be identified by a unique FIX CompID and can be only one of the above types.

For Own Trade Book and Own Order Book downloads the Trader Groups for which the requests are made must be permissioned for each FIX CompID making the request.

3.4.4 Native connection Users

As set out above Native connections are identified via the UserID. Only the Native Trading Gateway User is supported.

TraderGroups are used as the UserID for all Native Trading connections. To avoid clearing and settlement failures for cleared securities these need to be as per the clearing static data form. It should also be noted that orders on the book are effectively owned by the UserID that was used to submit the order.

3.5 Connection security

Following the FIX standard, Message Authentication is not supported on Millennium Exchange. However, each CompID is assigned a password on creation that must be specified in the first logon message. Participants are required to change the default password on first logon.

Following the first logon participants can manage passwords using the Logon message. Customers are not required to change passwords after a configurable number of days.

3.6 **Example configuration**

Participants can have any number of trading nodes or trading groups on request. An example configuration for a typical trading participant for illustrative purposes is illustrated in Figure below. Participants can discuss individual Test and Live configurations with London Stock Exchange.

3.7 **Cancel on disconnect / logout**

An optional cancel on disconnect and cancel on logout facility is provided. A disconnect is defined as a drop in the TCP session between the participant and Millennium Exchange, whether due to either party.

Cancel on disconnect / logout is configured for a CompID/UserID. Should the FIX / Native Trading Gateway associated with that CompID disconnect, then all orders / Executable Quotes entered under that CompID/UserID will automatically be deleted by Millennium Exchange. Participants can individually have a 'wait' period configured by which the system will wait a defined length of time before deleting orders / quotes.

Where a CompID/UserID has been opted in, if required, customers can elect to specifically exclude GTD orders from this automatic deletion process. Parked Committed Cross / BTF orders will not be deleted as part of a cancel on disconnect/ logout.

On reconnection, Millennium Exchange will send Execution Reports for the deleted orders and Quote Status messages for the deleted Executable Quotes.

3.8 **Message throttling**

In order to safeguard Millennium Exchange against 'abnormal' participant behaviour each User/CompID enabled for access to the Native and FIX Trading Gateways will not be allowed to exceed a specified message throughput determined by London Stock Exchange.

Every message sent by a participant that means that the maximum message rate of a User/CompID is exceeded (over a second period) will be rejected via a Business Message Reject for FIX and a Reject message for the Native Trading interface.

A User/CompID will be disconnected by the Trading Gateway if its message rate exceeds its maximum rate more than a configurable number of times in any 30 second duration. In such a case, the server will transmit a Logout message and immediately terminate the TCP/IP connection.

The maximum throughput of each participant's User/CompID will be agreed with London Stock Exchange.

3.9 **SETS Internaliser**

SETS Internaliser allows participants to elect that any trades between specified Trading Users within the same firm are not sent downstream to Clearing and Settlement. This service is supported on all Cleared services (SETS and where relevant International Order Book and SETSqx).

A trade will be internalised if:

- The Instrument is eligible for SETS Internalisation;
- The Trading User on each side of the trade are in the same internalisation group (a participant defined set of Trader Groups);
- Each side of the trade has the dealing capacities Principal or Riskless Principal; and
- Each side of the trade has the same clearing account type (i.e. House or Client).

Such trades will be identified as internalised trades by setting the Novated Indicator (Custom Tag 20111) to 0 on Trade Capture Reports sent by the Post Trade FIX Gateway.

Two Trade Capture Reports will be sent, one for each side of the trade. On each Trade Capture Report the counterparty will be specified as the Firm on the opposite side of the trade, not the CCP.

Likewise, Execution reports will also have the counterparty specified as the Firm on the opposite side of the trade.

To opt into SETS Internaliser a member firm should contact the Membership Team at London Stock Exchange:

- **membership@lseg.com**
- +44 (0) 20 7797 1900

3.10 **Self Execution Prevention (optional)**

Member firms that wish to avoid self-execution will now be able to register one or more of their own Native UserIDs or FIX CompIDs as a single Self Execution Prevention ("SEP") group. Where 2 orders from the same SEP group would otherwise execute against each other, one of the orders will instead be expired:

- Cancel Incoming Order (CIO), leaves resting order intact; or
- Cancel Resting Order (CRO), allows the incoming order to execute / rest.

Member firms must specify which of the above standing instructions should be applied to all Native UserIDs / FIX CompIDs in each SEP group.

A SEP group can only consist of a single member firm's Native UserIDs / FIX CompIDs. Each individual Native UserID / FIX CompID can only be applied to a single SEP. An individual member firm may have more than one SEP group.

SEP can be applied to all order types but not Executable Quotes. SEP will only prevent executions during Regular Trading and the Closing Price Crossing Session. It will not function for auction uncrossing trades (UTs) nor will it operate when a minimum execution size has been applied to a Mid Priced Pegged Order. Finally, it does not function for any of the following Time in Forces: FOK, OPG, GFA, GFX and ATC. SETS Internaliser is still available where SEP does not function.

SEP can be used in conjunction with Sponsored Access functionality. Maximum Gross Consideration validation will be applied prior to SEP, whilst the Current Gross Consideration will exclude anything captured by SEP.

To opt into SEP, a member firm should contact the Technical Account Management team at London Stock Exchange:

- **londontam@lseg.com**
- +44 (0) 20 7797 3939

4.0 Market Structure

4.1 **Market configuration**

Millennium Exchange supports the Trading Services identified in the following table. This also includes off book trade reporting (both on-Exchange and where relevant OTC).

Table 2 – Trading Services

Trading Service	Description	Coverage
SETS	Order book with Executable Quotes	FTSE100, FTSE250 and the FTSE Small Cap Index constituents as well as other liquid AIM, Irish, London secondary listed securities and EUI settled ETFs and ETPs
ETFs – Euroclear Bank settlement	Order book with Executable Quotes	Exchange Traded Funds to be settled by Euroclear Bank
Securitised Derivatives	Order book with Executable Quotes	Covered Warrants and other structured products
SETSqx – with Market Makers	Non electronically-executable quotes (Firm Quotes) with electronic order book auctions at 9am, 11am, 2pm & 4:35pm	Main Market securities not traded on SETS or less liquid AIM securities that have registered Market Makers
SETSqx –no Market Makers	Electronic order book auctions at 9am, 11am, 2pm & 4:35pm	Main Market securities not traded on SETS and AIM securities that are not supported by a registered Market Maker
SEAQ	Non electronically-executable quotes (Firm Quotes)	Less liquid AIM securities with at least 2 market
Fixed Interest (SEAQ)	Non electronically-executable quotes (Firm Quotes)	Sterling bonds & convertibles with market maker support

Trading Service	Description	Coverage
Fixed Interest (trade reporting only)	Trade reporting only	Non UK Government debt with no market maker support
Gilts	Trade reporting only	UK Government debt
Trade Reporting only	Trade reporting only	Non-MIFID, miscellaneous securities with no market maker support
European Quoting Service	Non electronically-executable quotes (Firm Quotes)	All Liquid EU Regulated Market securities (as defined by MiFID and excluding those traded on SETS and SETSqx)
European Trade Reporting	Off Book Trade Reporting	Trade reporting service for non-liquid MiFID and Swiss securities that are not on SETS, SETSqx or EQS
International Order Book (IOB)	Order book with Executable Quotes	International depositary receipts
Order book for Retail Bonds	Order book with Executable Quotes	Selection of UK and international debt denominated in retail size
Order book for Fixed Income Securities	Order book with Executable Quotes	Selection of more complex and / or wholesale-size denominated UK and international debt

4.2 **Business categorisation of securities**

From a business perspective an individual instrument is assigned to a grouping known as a ***trading sector.*** A collection of trading sectors are grouped together to form a ***trading segment.*** A specific ***Trading Service*** is a number of trading segments that share the same market model.

The ***Millennium Exchange Business Parameters Document*** maps these exact groupings and allows us to lay down specific criteria and thresholds that operate at each specific grouping level.

The Trading Services Breakdown tab of ***Millennium Exchange Business Parameters Document*** shows at a Trading Service Level:

- trading hours
- publication & settlement regime
- basis of opening & closing prices
- trade reporting, mandatory periods, auction timing
- structure of price monitoring and market order extensions

The Sector Breakdown tab of the ***Millennium Exchange Business Parameters Document*** shows at a trading sector level:

- which trading segment and therefore which Trading Service a trading sector belongs to
- whether sector belongs to a Regulated Market or MTF
- order & trade types allowed
- specific price monitoring and maximum spread thresholds
- size of any minimum order size

Other tabs of the ***Millennium Exchange Business Parameters Document*** show:

- selection criteria between SETS and SETSqx, comparison of the domestic Trading Services and a guide to how market maker obligations (EMS) are set
- the defined price format codes (tick sizes and trading currencies in operation for each trading segment)
- the detail of the delay regime in place for equity, International Order Book, Exchange Traded Funds and Exchange Traded Products
- minimum size of a hidden order by trading segment

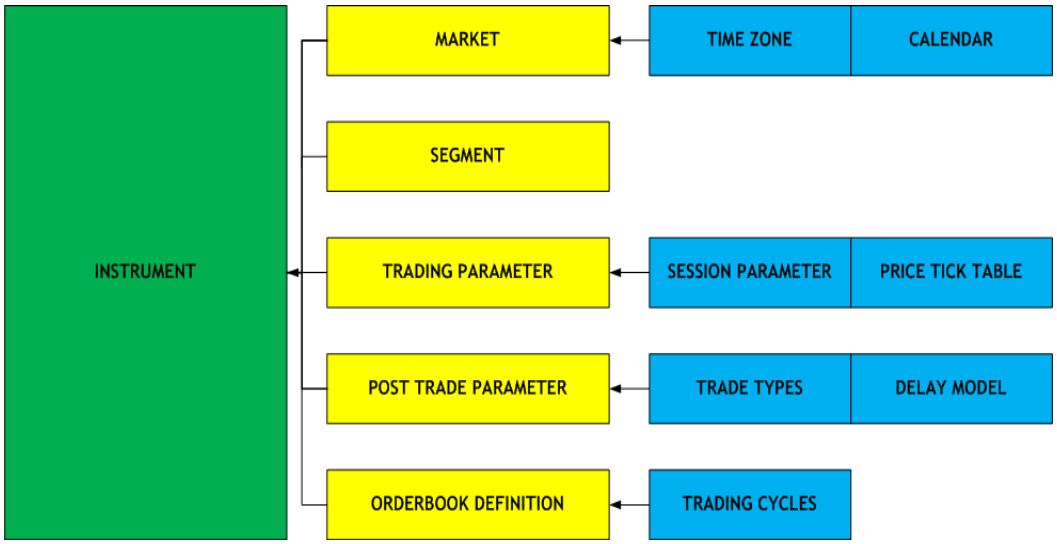
4.3 **Technical operation parameters**

The sectorisation documented above is maintained to segregate securities from a London Stock Exchange rules and wider regulatory perspective. Trading segments and trading sectors are not key fields for Millennium Exchange trading message entry. They are, however, defined and provided via the Reference Data Service.

In Millennium Exchange, instruments are technically structured as follows:

- Each instrument will be assigned to a Market and Segment
- Markets are allocated a Time Zone and associated Calendar
- Instruments will have specified trading and post trade parameters assigned that dictate how the instrument is traded
- A Trading Parameter consists of session parameters and a price tick table
- A Post Trade Parameter consists of trade types and delay model
- Instruments are assigned to an Order Book with a pre-determined Trading Cycle

Figure 4 – Technical structure of an instrument on Millennium Exchange



The following section describes the structure components and parameters. All parameters will be available via the Reference Data Service (see Section 2.4).

Time Zone

- A Time Zone is attached to each Market
- Time is Off Set from UTC

Calendar

- A Calendar is assigned to each Instrument
- Pre-define dates when:
    - Trading Allowed
    - Settlement Allowed
    - Early Closing
    - EDSP Auction Day
- Exchange Calendars are:
    - EQS & ITR only
    - FTSE100
    - FTSE250 only
    - IOBE (Euroclear)
    - IB SGX
    - ETFS EUROCLEAR
    - LSE

Market

A Market is assigned to each Instrument:

- 2 Markets currently set up:
    - LSE
    - European EQS and ITR

Session Parameters

Session Parameters are added to a Trading Parameter and include:

- Static and Dynamic Circuit Breakers
- Market Order Extension and Duration
- Price Monitoring Extensions and Duration
- Duration to Auction (amount of time prior to a scheduled auction during which invocation of a circuit breaker would see immediate transition into the following scheduled auction without a return to regular trading)
- Minimum Volume

Trading Parameter

Trading Parameters are assigned to each Instrument and include:

- Tick Tables - this will either consist of fixed price format codes or a dynamic regime. See section 5.5 for further details
- Session Parameters
- Order and Quote Parameters
- Auction Parameters
- Market Data - Opening and Closing Price Calculation
- Daily Official List information

Trading Cycles

These define Session Transition Times (based on the business Sector outlined in section 4.2). Separate cycles created for:

- Order Book
- Bulletin Book
- Off Book (Trade Reporting)

Delay Models

- Delay models are attached to each Post Trade Parameter.

- There are four types of Delay Model:
    - MiFID delay and other regimes based on ADT and Currency of security concerned
    - 24 hour delay
    - 24 Hour delay for trades over £50,000
    - Permanent suppression for trades in excess of £50,000

The ***Millennium Exchange Business Parameters Document*** shows by Trading Service which Delay Model is used.

Post Trade Parameter

- Post Trade Parameters are added to each Instrument.

- They consist of the following Trade Reporting configuration:
    - Delay Model (can only have one Delay or one MiFID Delay)
    - Trade Types (in table form)
    - Price Factor

Further detail including all the individual fields can be found in MIT401 Guide to Reference Data Services.

4.4 **Trading Sessions**

Order book instruments generally follow a trading day consisting of an opening auction, regular trading and, where applicable, a closing auction followed by a Closing Price Crossing Session. Timings and associated trading parameters will vary according to the market model and are found in ***Millennium Exchange Business Parameters Document***. Where necessary, the trading day will reflect special conditions such as EDSP auctions, early closing and first day of trading, along with any market control actions invoked by London Stock Exchange that override the normal schedule.

As an instrument moves from one trading session to another the Millennium Exchange Information system disseminates the new status of that instrument via the symbol status message (MITCH) and the Instrument status message (GTP). Please see MIT303 - MITCH Message Specification and GTP002 – Technical Guide for further information.

Scheduled Trading Sessions

The following status will be disseminated in accordance to the relevant trading cycle in operation for that security. The *Trading Cycles* tab of the ***Millennium Exchange Business Parameters Document*** groups trading segments to the relevant Trading Cycle:

- Pre- Trading
- Opening / First Auction Call
- Regular Trading
- Pre-Mandatory (quoting)
- Mandatory (quoting)
- Post-Mandatory (quoting)
- EDSP (auction call)
- Close (auction call)
- Closing Price Publication Session (CPP)
- Closing Price Crossing Session (CPX)
- Periodic (auction call)
- Post Close

Unscheduled Trading Sessions

- AESP (auction call) - follows a price monitoring interruption to regular trading
- Resume (auction call) - precedes resumption of regular trading where unscheduled interruption to trading was for reason other than the invocation of price monitoring
- Halt - see section 11 for more information
- Suspend - see section 11 for more information
- Pause - see section 11 for more information
- Halt & Close - see section 11 for more information

4.5 **Closing Price Crossing Session (CPX)**

CPX is a short, modified regular trading session that follows the closing auction, where executions can only be executed at the closing auction price.

The exact start time of the CPX will be determined by the number of Price Monitoring/Market Order extensions an instrument enters into and duration of the random period(s) prior to the completion of the closing auction uncrossing.

The finishing times for the CPX session are set out on the *Trading Cycles* tab of the ***Millennium Exchange Business Parameters Document*** for detailed timings.

As a guide the SETS and SETSqx CPX end times are determined (where relevant) as below. Please note that the random period is irrelevant when establishing the scheduled closing auction time.

- If the instrument does not enter into any extensions, the CPX will end 5 minutes after the scheduled closing auction uncrossing time.
- If the instrument experiences one extension (regardless of whether it is a market order or price monitoring extension), the CPX will end 10 minutes after the scheduled closing auction uncrossing time.
- If the instrument experiences two extensions or more, the CPX will end 15 minutes after the scheduled closing auction uncrossing time.

If there is no closing auction execution due to an uncrossed book, or following price monitoring and/or market order extensions where the price is still outside the ruling parameters and any ruling minimum auction volume has not been satisfied, the CPX will not occur in that security that day.

Table 8 in Section 5 sets out the permissible Time in Forces for both CPX and the Closing Price Publication (CPP) session that immediately precedes it. All orders accepted during the CPP session are parked and are then injected or expired at the start of the CPX session as applicable. During the CPP session, parked orders may be amended but orders entered prior to the CPP cannot be amended at that time.

At the commencement of the CPX period, Limit, Iceberg and Hidden Orders that remain from the closing auction and are priced at the auction price will become active and available for execution at the closing auction price only.

The other remaining orders from the closing auction that are priced worse than the closing auction price will remain inactive throughout the CPX unless amended, expired or cancelled.

Orders entered (and therefore parked) during the CPP are injected at the closing auction price, unless they are priced worse than the auction price in which case they are expired. Therefore, any orders priced more aggressively will be re-priced to the closing auction price.

If there is no closing auction execution the CPX does not occur and all orders parked during the CPP session will be expired at the transition to the Post Close session.

Stop and Stop Limit Orders that are triggered by the closing auction price will not participate during the CPX, they will remain parked. If they remain un-expired they are instead injected during the Post Close trading session, meaning they will be active in the following opening auction session.

During the CPX period, Market Orders and orders priced at the closing auction price are accepted. Orders priced at any other value will be rejected.

Any orders entered during CPP or CPX sessions will be expired at the transition to the Post Close session in line with the Time In Force used.

Orders active during the CPX can be amended for both order quantity and display quantity. Inactive orders may be made active by amending limit price to closing auction price. Any other order amendments are rejected.

All orders (active, inactive and parked) may be cancelled throughout the CPX.

4.6 **Symbology**

Instruments are identified on trading messages using a unique InstrumentID.[7]

The InstrumentID remains constant for the lifetime of the instrument, even if data pertaining to that instrument changes. However participants should note that in some cases an instrument is deleted and re-added should the ISIN or TIDM be changed.

London Stock Exchange provides InstrumentIDs via the Reference Data Service.

Full details of the interface are specified in MIT401 – Guide to Reference Data Services.

[7] Specified in Tag 48 – SecurityID on FIX messages

5.0 Orders and Quotes

It should be noted that the Order Types are not *explicitly* stated on FIX and Native messages, but are defined via a combination of tags. Please see the interface specifications for further information.

5.1 **Order & Quote types**

Table below summarises the orders and quote types supported by Millennium Exchange. More information on those that are actually available on each trading Service is set out on the ***Millennium Exchange Business Parameters Document.***

Table 3: Order & Quote functionality supported

Order / Quote Type	Description
Limit Order	A Limit Order is an anonymous priced order that is fully displayed when persistent in an order book and may execute at prices equal to or better than its limit price. Limit Orders never have price priority over market orders
Market Order	A Market Order is un-priced, and therefore not price forming, but has price priority over all priced orders. Market Orders cannot persist on the order book during the ***regular*** scheduled trading session but will during an auction if they have an appropriate Time in Force (this includes where the incoming Market Order actually triggers an AESP auction call). Any that remain unexecuted following the completion of the auction will be automatically deleted
Stop Limit Orders	A Stop Limit Order is a Limit Order that will remain unelected (will not be entered into order book) until the stop price is reached. Once elected, a Stop Limit Order will be treated as a regular Limit Order
Stop Orders	A Stop Order is a Market Order that will remain unelected (will not be entered into order book) until the stop price is reached. Once elected, it will be treated similar to a regular Market Order

Order / Quote Type	Description
Iceberg Orders	An Iceberg Order publicly displays only a portion of its total volume that is available for execution. The maximum displayed amount, known as the peak size, and the total size of the order can be specified by the participant and must be above specified minimums. Where enabled, customers have the option to have the refreshed peak size randomised. On each peak refresh, the size will be randomised within a set band above the value of the initial peak size entered with parameters published in the ***Millennium Exchange Business Parameters*** document.
Passive Only	On entry order will only immediately execute against non visible orders that are better than touch, any remaining quantity will then only be added to the order book if it is within the number of visible price points from the prevailing BBO prescribed by the submitter
Hidden Limit Orders	Non-displayed limit order that on entry must exceed in size the relevant MIN RESERVE ORDER VALUE trading parameter. It is not possible to apply a Minimum Execution Size on a Hidden Limit Order
Mid Price Pegged Orders	Non-displayed order which if persistent, must exceed in size the relevant MIN RESERVE ORDER VALUE trading parameter on entry. Its limit updates to the mid of the security's visible best bid/offer. A Minimum Execution Size may be applied to any persistent Mid Price Pegged Order
Named Orders	A Named Order is a non-anonymous limit order available to all participants on SETSqx
Executable Quotes	Only for use by participants that are registered in individual instruments on SETS, IOB, Securitised Derivatives or Order Book for Retail Bonds as a market maker. Fully visible, electronically executable, named, dual sided quotes that must meet prescribed size and spread requirements on entry
Internal Cross	A dual sided order, agreed or identified within a single member firm, that will execute with each other side at a price between visible best bid and visible best offer (including extremes)
Internal BTF	A dual sided order, agreed or identified within a single member firm, that will execute with each other side at a price between visible best bid – a configurable percentage and visible best offer + configurable percentage (including extremes). The percentage will be determined by London Stock Exchange
Committed Cross	A single sided order, agreed or identified by two different member firms, that will execute with the other side of the cross at a price between visible best bid and visible best offer (including extremes)

Order / Quote Type	Description
Committed BTF	A single sided order, agreed or identified by two different member firms, that will execute with the other side of BTF at a price between visible best bid - configurable percentage & visible best offer + configurable percentage (including extremes). The percentage will be determined by London Stock Exchange
Firm Quotes[8]	Only for use by participants that are registered in individual SETSqx or SEAQ securities as a market maker. Fully visible, non-electronically executable, named, dual sided quotes that must meet a prescribed entry size

[8] Only available via the FIX Interface

5.2 **Order entry fields (Rule 2102)**

The following table shows which fields are mandatory and which are optional for a Millennium Exchange Order.

Table 4 – Order entry fields

Field	Required	Description	Possible Values
Instrument	Yes	The unique identifier of the security	
Side	Yes	Whether the order is to buy or sell	Buy Sell
Order Type	Yes	The type of the order, in conjunction with Order Sub Type (Native) or DisplayMethod (FIX)	Market Limit Stop Stop limit Pegged Random Peak Size Iceberg
Time in Force	No	The duration the order is valid for. If the time in force is not stated, the system assumes it to be a DAY order	DAY IOC FOK OPG GTC[9] GTD GTT ATC GFA GFX GFS CPX[10]

[9] Not currently used on any London Stock Exchange market models.

[10] On FIX Interface, CPX is actually entered as a dedicated block named Trading Session. Where CPX is selected, it is also possible to enter DAY as the TIF, this is not necessary and is ignored on submission.

Field	Required	Description	Possible Values
Order Quantity	Yes	The quantity being bought or sold. This should be a whole number that is greater than zero	
Disclosed Quantity	No	The maximum quantity, if any, that may be displayed. This should be a whole number. For Iceberg Orders, this will be greater than zero but less than the order quantity. For Hidden Orders, this will be zero. For Limit Orders, this will be the same as Order Quantity	
Price	No	The maximum/minimum price a buy/sell order may be executed at. This value should be greater than zero and a multiple of the instrument's 'Tick'. This field is required if the order is a Limit or a Stop Limit Order	
Stop Price	No	The price at which the order may be elected. This value is required if the order is a Stop or Stop Limit Order. This value should be greater than zero and a multiple of the instrument's 'Tick'	
Capacity	Yes - London Stock Exchange Rule 2102	Denotes if the order is entered as an 'Agency' (on behalf of a client), 'Principal' (own account) or Riskless Principal (own account but on a request of a client)	Agency Principal Riskless Principal CFD Give-up
Expiry Time	Required if time in force = GTT	The time at which a GTT order will be expired	
Expiry Date	Required if time in force = GTD	The date on which a GTD order will be expired. Maximum expiry allowed : date of entry plus 89 calendar days	
Trading Party	Yes	The trading party of the order is identified by this field. For Exchange users this will be the trader group	
Client Reference	No	This will be the client reference of the order	

Field	Required	Description	Possible Values
Clearing Account	Yes	Identifies the clearing account for the order	Client House
Pre Trade Anonymity	No	Whether the order is anonymous or named	- Anonymous - Named
Passive Only Order	No	Order level parameter to allow clients to specify that they would like their order to rest prior to execution, with flexibility for visible orders to rest at a specified price level on the book. No protection is provided against order execution against hidden (dark) orders No Constraint (default) Only accept order if it will not match with visible contra order. Otherwise expire order Only accept order if setting new visible BBO, otherwise expire order Only accept order if setting new BBO or joining existing BBO. Otherwise expire order Only accept order if will be at BBO or within one visible price-point. Otherwise expire order Only accept order if will be at BBO or within two visible price-points. Otherwise expire order	0 99 100 1 2 3
Cross Type	No	Where using the Cross Orders and Block Trade Facility. Required **Order Type Field** is Limit If a **Time in Force** is provided it must be DAY. There are 4 possible values	- Internal Cross - Internal BTF - Committed Cross - Committed BTF
Minimum Quantity	No	Optional Minimum Execution Size for Mid Price Pegged DAY/GTT orders only. Order will be rejected if value other than 0 selected for any other order / TIF combination	0 = no MES

Following tables specify the FIX tags and Native fields that should be used to define each order type.

Table 5 – FIX Tags

	FIX Tag			
Order Type	**40 OrdType**	**1091 PreTradeAnonymity 11**	**1138 DisplayQty**	**1084 Display Method**
Limit Order	2	Y or NA	TotalQty	NA
Market Order	1	Y or NA	TotalQty	NA
Named Limit Order	2	N	TotalQty	NA
Hidden Limit Order	2	Y or NA	0	4
Iceberg Order	2	Y or NA	Peak Size[12]	NA
Random Peak Size Iceberg Order	2	Y or NA	Initial Peak Size[11]	3
Mid Price Pegged Order	P	Y or NA	0	4
Mid Price Pegged Order with Limit	P	Y or NA	0	4
Stop Order	3	Y or NA	TotalQty	NA
Stop Limit Order	4	Y or NA	TotalQty / Peak Size / or 0	NA
Passive Only Order	2	Y or NA	TotalQty / Peak Size / or 0	NA
Cross Orders and Block Trade Facility	2	NA	NA	NA

[11] Absence of this field is interpreted as Anonymous
[12] See Millennium Exchange Business Parameters for minimum size

Table 6 – Native Fields

	Native Field			
Order Type	**Order Type**	**DisplayQty**	**Order Sub Type**	**Anonymity**
Limit Order	2	TotalQty	0	0
Market Order	1	TotalQty	0	0
Named Order	2	TotalQty	0	1
Hidden Limit Order	2	0	0	0
Iceberg Order	2	Peak Size[13]	0	0
Random Peak Size Iceberg Order	2	Initial Peak Size[12]	51	0
Mid Price Pegged Order	1	0	5	0
Mid Price Pegged Order with Limit	2	0	5	0
Stop Order	3	TotalQty	0	0
Stop Limit Order	4	TotalQty / Peak Size / or 0	0	0
Passive Only Order	2	TotalQty / Peak Size / or 0	0	0
Cross Orders and Block Trade Facility	2	NA	NA	NA

[13] See Millennium Exchange Business Parameters for minimum size

5.3 **Time in Force**

The following table summarises all the Millennium Exchange Time In Forces.

Table 7 – Millennium Exchange Time In Force

Time in Force	Behaviour
DAY	Expired at the end of the day on which it was entered
GTC[14]	On Book until cancelled by the participant
GTD	Good to Date. Expired at the end of trading on the day specified in the order. If the specified day is a non-business day then the order will expire before start of trading on the next business day. Maximum expiry allowed is date of entry plus 89 calendar days
GTT	Good To Time. Any GTT orders with an expiry time during any auction call phase will not be expired until after uncrossing has completed and are therefore eligible to participate in that uncrossing. GTT orders timed to expire during a CPP or CPX trading sessions will be expired at the prescribed time. Any remaining GTT orders will be expired at the end of trading day
IOC	Immediate or Cancel. Executed on entry, with any remaining unexecuted volume expired
FOK	Fill or Kill. Executed in full on entry or immediately expired
OPG	Participates in the Opening or First Auction with any remaining volume expired after uncrossing. Order rejected if an instrument does not have a scheduled Opening / First Auction or uncrossing has passed that day
GFA	Injected as soon as in auction phase (Opening / First, AESP, EDSP, and Closing) with any remaining volume expired after uncrossing. If no auctions in a trading day then expired after end of trading
GFX	Injected as soon as in an EDSP auction with any remaining volume expired after uncrossing. Order rejected if there is no EDSP auction scheduled for that instrument on the trading day
ATC	Injected as soon as in a Closing Auction with any remaining volume expired after uncrossing. Order rejected if an instrument does not have a scheduled Closing Auction

[14] Although GTC is technically supported, all current London Stock Exchange market models specify a maximum duration for persistent orders therefore GTC will not be permitted and the GTD Time In Force should be used instead

Time in Force	Behaviour
GFS	Injected as soon as in a scheduled auction (excludes AESP and EDSP) with any un-executed volume parked after uncrossing and injected at the start of the next scheduled auction (excludes AESP and EDSP) that day. No further execution after the completion of the closing auction, with any remaining un-executed volume expired in the Post Close session
CPX	Injected as soon as in a Closing Price Crossing Session with any remaining volume expired after the end of that session or on confirmation that there will be no Closing Price Crossing Session in that instrument that day

When considering Time in Force the following is worth being aware of:

- Expiry times cannot be specified for a GTD order. Therefore all orders with a GTD Time In Force will be expired at the end of trading on the date of expiry (or before start of trading the following business day if expiry date is a non-business day)
- Any GTD order specified with an expiry date greater than date of entry plus 89 calendar days will be rejected
- Any GTT orders with an expiry time during any auction call phase will not be expired until after uncrossing has completed and are therefore eligible to participate in that uncrossing. To avoid possibility of execution in this scenario, a participant is required to manually delete their orders. GTT orders timed to expire during a CPP or CPX trading session will still be expired at the prescribed time.
- Subject to above, GTT expiry times can be specified to the nearest second.
- Orders will only be injected for auctions that day – any orders with a OPG, GFA, GFX, ATC or GFS Time In Force will be expired at the end of day
- Orders parked awaiting injection, are assigned time priority on the basis of the time they were last parked not their original order entry time. Therefore an unexecuted GFS order would be parked behind an ATC (at the same price point) entered prior to the scheduled auction uncrossing that the GFS had participated in.
- During auction call sessions, any order (including market orders) with IOC and FOK TIF will be rejected

5.4 **Order / Time In Force combinations**

The tables that follow specify which combinations of Order Type and Time In Force are valid on Millennium Exchange in each of the key trading sessions of order driven trading services excluding SETSqx and then SETSqx itself.

Table 8.1 – Trading session / Order / Time In Force – Excluding SETSqx

		Time In Force											
Session	Order Type	Day	IOC	FOK	OPG	GTC	GTD	GTT	ATC	GFA	GFX	GFS	CPX
During Auction Calls	Market	Allowed	Rejected	Rejected	Until OPG uncross	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Allowed
	Limit	Allowed	Rejected	Rejected	Until OPG uncross	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Allowed
	Iceberg	Allowed	Rejected	Rejected	Until OPG uncross	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Rejected
	Hidden	Allowed	Rejected	Rejected	Until OPG uncross	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Rejected
	Stop	Allowed	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Allowed	Rejected	Rejected	Rejected	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Parked until uncrossing	Parked until uncrossing	Parked until uncrossing	Rejected	Rejected	Rejected	Parked until uncrossing	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Parked until uncrossing	Parked until uncrossing	Parked until uncrossing	Rejected	Rejected	Rejected	Parked until uncrossing	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Cross Orders and Block Trade Facility	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During Regular Trading	Market	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Allowed
	Limit	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Allowed
	Iceberg	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Rejected
	Hidden	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Allowed	Allowed	Allowed	Until GFX uncross	Allowed	Rejected
	Stop	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Allowed	Allowed	Allowed	Rejected	Rejected	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Allowed	Allowed	Allowed	Rejected	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Allowed	Allowed	Allowed	Rejected	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Cross Orders and Block Trade Facility	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

Table 8.1 – Trading session / Order / Time In Force – Excluding SETSqx – cont'd

		Time In Force											
Session	Order Type	Day	IOC	FOK	OPG	GTC	GTD	GTT	ATC	GFA	GFX	GFS	CPX
During CPP Session	Market	Parked until CPX	Parked until CPX	Parked until CPX	Rejected	Rejected	Rejected	Parked until CPX	Rejected	Rejected	Rejected	Rejected	Parked until CPX
	Limit	Parked until CPX	Parked until CPX	Parked until CPX	Rejected	Rejected	Rejected	Parked until CPX	Rejected	Rejected	Rejected	Rejected	Parked until CPX
	Iceberg	Expired in CPX	Expired in CPX	Expired in CPX	Rejected	Rejected	Rejected	Expired in CPX	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	Expired in CPX	Expired in CPX	Expired in CPX	Rejected	Rejected	Rejected	Expired in CPX	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Cross Orders and Block Trade Facility	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During CPX Session	Market	Allowed	Allowed	Allowed	Rejected	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Allowed
	Limit	Allowed	Allowed	Allowed	Rejected	Rejected	Rejected	Allowed	Rejected	Rejected	Rejected	Rejected	Allowed
	Iceberg	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Cross Orders and Block Trade Facility	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected

A Market Order with a persistent TIF entered or injected during a non-auction phase will act as an IOC order unless it generates a circuit breaker. In which case any remaining order quantity, following execution, will reside in the order book for the duration of the circuit breaker auction with the original specified persistent TIF.

Table 8.2 – SETSqx with Market Markets Trading session / Order / Time In Force

		Time In Force											
Session	Order Type	Day	IOC	FOK	OPG	GTC	GTD	GTT	ATC	GFA	GFX	GFS	CPX
During Auction Calls	*Market*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*
	Limit	*Rejected*	Rejected	Rejected	Until OPG uncross	Rejected	Rejected	Rejected	*Rejected*	Allowed	*Rejected*	Allowed	Allowed
	Iceberg	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Hidden	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
During Regular Trading	Market	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Limit	*Rejected*	Expires un-executed on entry	Expires un-executed on entry	Rejected	Rejected	Rejected	Rejected	*Rejected*	Allowed	*Rejected*	Allowed	Allowed
	Iceberg	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*	*Rejected*
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*

Table 8.2 – SETSqx with Matket Makers Trading session / Order / Time In Force – cont'd

		Time In Force											
Session	Order Type	Day	IOC	FOK	OPG	GTC	GTD	GTT	ATC	GFA	GFX	GFS	CPX
During CPP Session	Market	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*
	Limit	*Rejected*	Parked until CPX	Parked until CPX	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected	Rejected	Rejected	Parked until CPX
	Iceberg	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During CPX Session	Market	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit	*Rejected*	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed
	Iceberg	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected

Table 8.3 – SETSqx without-Market Markets Trading session / Order / Time In Force

Time In Force													
Session	Order Type	Day	IOC	FOK	OPG	GTC	GTD	GTT	ATC	GFA	GFX	GFS	CPX
During Auction Calls	*Market*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*
	Limit	*Rejected*	Rejected	Rejected	Until OPG uncross	Rejected	Rejected	Rejected	*Rejected*	Allowed	*Rejected*	Allowed	Allowed
	Iceberg	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Hidden	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
During Regular Trading	Market	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected
	Limit	*Rejected*	Expires un-executed on entry	Expires un-executed on entry	Rejected	Rejected	Rejected	Rejected	*Rejected*	Allowed	*Rejected*	Allowed	Allowed
	Iceberg	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*	*Rejected*
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	*Rejected*

Table 8.3 – SETSqx without-Market Makers Trading session / Order / Time In Force – cont'd

		Time In Force											
Session	Order Type	Day	IOC	FOK	OPG	GTC	GTD	GTT	ATC	GFA	GFX	GFS	CPX
During CPP Session	Market	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*
	Limit	*Rejected*	Parked until CPX	Parked until CPX	Rejected	Rejected	Rejected	*Rejected*	Rejected	Rejected	Rejected	Rejected	Parked until CPX
	Iceberg	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
During CPX Session	Market	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected
	Limit	*Rejected*	Allowed	Allowed	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Allowed
	Iceberg	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Hidden	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected
	Stop	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Stop Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Pegged	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Pegged Limit	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected
	Executable Quotes	*Rejected*	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	Rejected	*Rejected*	Rejected

5.5 **Price Format Code ("tick size")**

The Price Format or tick size is the minimum valid increment in which order and quote prices can be entered and displayed. Each tick size is a numeric amount, representing a multiple of the unit of currency in which the instrument is quoted, and is identified by a single letter price format code.

If the price of an order/quote is not a multiple of the tick size on entry it will be rejected.

Tick sizes may either be 'static' or 'dynamic':

- a static tick size is a single, fixed value applied to all orders / quotes in a specific security until amended by London Stock Exchange
- where a dynamic tick schedule is in place the tick size in operation is determined with reference to the intended price of the incoming order / quote

The tick regime, sizes and the associated price format codes used can be found in the ***Millennium Exchange Business Parameters*** document.

Tick sizes have no relevance for the price field of manual trade reports.

5.6 **Content of quotes**

Market Makers
The applicable market making rules are set out in paragraphs 4000 to 4510 of the Rules of the London Stock Exchange, which can be found at the link that follows:

www.londonstockexchange.com/traders-and-brokers/rules-regulations/market-making/market-making.htm

The obligations of market makers in order driven securities section (rules 4100 -4110.5) covers trading services SETS, IOB, Securitised Derivatives and Order Book for Retail Bonds where registered market makers use Executable Quotes (EQ) to display their quote.

The obligations of market makers in quote driven securities section (rules 4200 – 4334) covers trading services SETSqx, SEAQ and European Quoting Service where registered market makers use Firm Quotes to display their quote. Only Member Firms that have at least 1 Member ID that supports central counterparty clearing arrangements are permitted to register to provide Firm quotes on any of their Member IDs. Any Member Firm that ceases to have any of its Member IDs supporting central clearing arrangements will be de-registered in all of its quote driven securities under Rule 4002.

Before a member firm can register in an individual security it needs to be identified to the market as a market maker. This would represent a change of its membership profile and would need to be notified under paragraph 1051 of the Rules of the London Stock Exchange. Such notifications should be made to the Membership Team:

- **membership@lseg.com**
- +44 (0) 20 7797 1900

Once a member firm is identified as a market maker, the form for registration / deregistration for individual securities is called the ***Registration Information Form*** and is accessed from the following link:

www.londonstockexchange.com/traders-and-brokers/rules-regulations/formsagreements/formsagreements.htm

Completed ***Registration Information Form*** should be e mailed to: **msu@lseg.com**

Quote size

Both the bid and offer size on a quote on entry must be at least London Stock Exchange Market Size (minimum quote size) for that specific security. All Firm and Executable Quotes that do not meet at least EMS will be rejected.

Executable Quote maximum spread

The spread between the bid and offer prices must be at least one tick size and subject to the maximum spread floor no more than the maximum spread percentage specified for the relevant security. When validating maximum spreads the absolute spread (offer less bid) is divided by the mid price of the spread (offer plus bid, divided by 2) to determine a percentage spread which is assessed against the permitted maximum. Executable Quotes that are wider than the permitted maximum spread will be rejected, unless it is less than the maximum spread floor. Details of the maximum spread percentage and maximum spread floor in place are contained in the ***Millennium Exchange Business Parameters*** document.

5.7 **Order book priority & execution policy**

Millennium Exchange operates on a price priority basis.

Displayed parts of orders take precedence over non-displayed parts at any price point. With non-display portions of icebergs taking precedence over fully Hidden Orders, which in turn take precedence over Mid Price Pegged orders. With the exception of the non-displayed iceberg portion each category is then prioritised by time submitted to the book. Further explanation for non-displayed part of icebergs can be found in section 6.3.

All valid orders entered in the regular trading session that are available for immediate execution attempt to aggress the book and will execute as far as permissible at the resting order's limit price.

An accepted order price amendment would lead to a persistent order to re-aggress the order book as above.

6.0 Order Behaviour

6.1 **Mid Price Pegged Orders**

On Millennium Exchange, if a limit price is specified for a pegged order and the limit price is breached, either on entry or whilst the order is persisting on the book, then the order will be made inactive until the limit price is marketable again.

However, where there is no BBO on Millennium Exchange, existing orders are expired and further pegged orders are rejected on entry.

A Minimum Execution Size (MES) may be applied to a persistent Mid Price Pegged order. If a MES is provided in any other circumstance the order will be rejected.

A Mid Price Pegged order will re-aggress the order book on every mid-price change unless the order quantity on original submission when valued at the revised mid-price is below the MIN RESERVE ORDER VALUE . The same is true when a deactivated Mid price peg order is re-activated as it moves back within its limit range.

As with the original order submission, a customer requested amendment instruction on a Mid Price Peg order that would fail the MIN RESERVE ORDER VALUE would itself be rejected.

As well as persistent mid-priced peg orders, aggressive only mid-priced pegs are available, to seek liquidity at the mid price, by using time in forces Immediate or Cancel (IOC) or Fill or Kill (FOK). Non-persistent Mid Price Pegged orders have no MIN RESERVE ORDER VALUE requirement.

6.2 **Stop and Stop Limit Orders**

Definition of Stop and Stop Limit Orders

A Stop Order is a Market Order that will be parked until the stop price is met. At this point, the order is injected into the order book as a 'regular' un-priced market order.

A Stop Limit Order is a Limit Order that will be parked until the stop price is reached. At this point the order is injected into the order book as a 'regular' limit order. Should the Stop Limit's expiry time be reached prior to the injection event, it will be expired without being injected onto the book. Participants may modify Stop and Stop Limit orders whilst parked.

The order Time In Force is generally applied once the order is injected. However, participants should note that only specified Time In Force are supported, depending on the trading phase. Any Stop or Stop Limit orders entered with a Time In Force that is not supported will be rejected (see **Table 8.1**).

If a Stop Limit order is entered with a TIF of FOK or IOC, and it cannot be immediately injected onto the book at entry, it will be rejected.

Injection Rules for Stop and Stop Limit Orders

Stop and Stop Limit Orders can be entered during an auction call but can only be eligible for election at the start of the next continuous trading phase.

Stop and Stop Limit orders are elected on the basis of the last automated trade price (including Uncrossing Trades):

- Stop and Stop Limit buy orders will be elected if the last traded automated trade price is equal or greater than the stop price
- Stop and Stop Limit sell orders will be elected if the last traded automated trade price is equal or less than the stop price

An incoming Stop or Stop Limit Order will be elected on entry if the stop price is already reached. If there has been no automated trading on the day of entry then any incoming Stop or Stop Limit order will be parked.

If multiple Stop and Stop Limit Orders are elected onto the book then the order of election will be based on the stop price value and time of entry:

- Eligible Stop and Stop Limit buy orders with the lowest stop price will be elected first
- Eligible Stop and Stop Limit sell orders with the highest stop price will be elected first
- Stop and Stop Limit Orders at the same stop price are elected based on time priority

After uncrossing, order of election will be as follows:

- Orders will be injected in terms of the difference between their stop price and the auction price
- The buy or sell order with the greatest difference between its stop price and the auction price will be injected first
- Where there are multiple orders with the same difference, the oldest order will be injected first

Stop and Stop Limit Orders that are elected by the closing auction price will **not** participate during the Closing Price Crossing Session (CPX). They will remain parked and will be injected into the following opening auction call if they remain un-expired.

6.3 **Iceberg Orders**

The display (peak) quantity of an Iceberg Order is refreshed once the display quantity has been fully executed. On refresh, the peak will be prioritised after all existing, visible orders at that price point. Where enabled, customers have the option to have the refreshed peak size randomised. Using the randomised peak size refresh iceberg order type, on each peak refresh, the size will be randomised within a set band above the value of the initial peak size entered. The ***Millennium Exchange Business Parameters*** document provides details of which securities have the option of the randomised iceberg peak refresh size and the applicable maximum percentage above the initial peak size that the randomised peak refresh size could be. Customers are always able to opt for fixed peak size for all iceberg orders where they prefer.

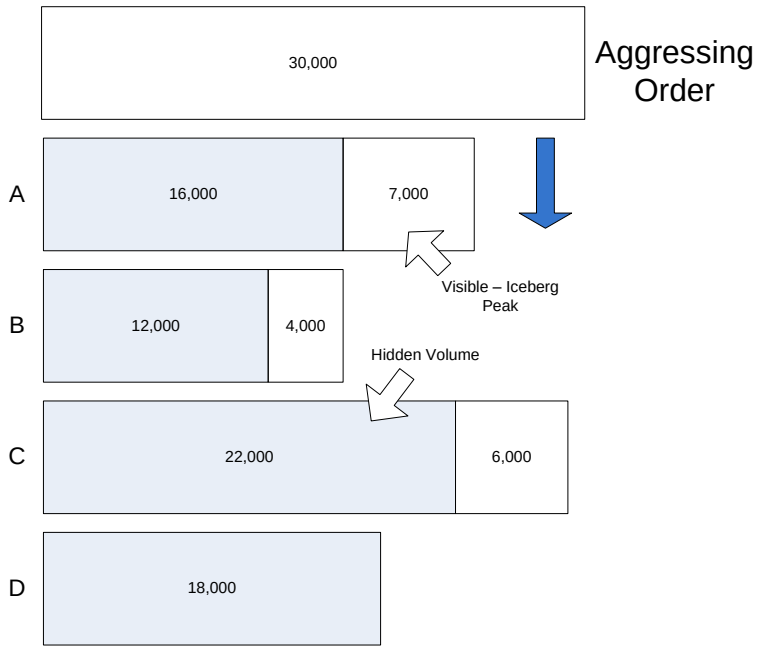
It is worth noting how the following scenarios will be handled:

- If the incoming order is sufficiently large then each peak at the same price point will be executed against in time priority. However, once peak volume of all iceberg orders at a price level has been fully executed then any remaining incoming volume is allocated to the hidden volume of each iceberg order pro-rated on the remaining size of each iceberg order. Note that, in such situations, participants will receive two executions for each iceberg order – one for the visible, and one for the hidden volume.

  Any remaining incoming volume is then allocated to any fully hidden orders before moving to the next price level. The total volume (hidden and visible) of an iceberg order always has a higher priority than fully hidden orders at the same price level

This approach applies to both Regular Trading and Auction executions and is illustrated conceptually below. Order sizes are for illustrative reasons only and do not reflect any actual configuration or market model.

Figure 5 – Iceberg Order Execution



3 Iceberg Orders (Orders A, B ,C)
1 Hidden Order (Order D)
ALL Orders are at the same Price Point

Incoming Order, Size 30,000 aggresses against this Price Point

All Iceberg Order Peaks execute:
Order A: 7,000
Order B: 4000
Order C: 6000

Total Hidden Iceberg Order Volume = 50,000

Remaining aggressing volume = 13,000 which is allocated to the hidden Iceberg Order Volume as follows.

Order A: 16/50 x 13,000 = 4160
Order B: 12/50 x 13,000 = 3120
Order C: 22/50 x 13,000 = 5720

No aggressive volume remains, so Hidden Order D is not executed against. Would only execute if incoming Order > 67,000

6.3.1 Modification of an Iceberg Order

Price, size and expiry can be amended for each iceberg order type through the Order Cancel / Replace Request message. When modifying an Iceberg Order a participant must submit both a value for Order quantity and Disclosed quantity. If the latter is set to a quantity greater than the actual visible peak of that order on receipt by the trading system, the order will lose time priority.

Customers cannot switch from a randomised peak size refresh iceberg order to a fixed peak size refresh iceberg order, or vice versa.

6.4 **Passive Only Order**

During regular trading clients are able to specify a visible price point below which they would not like the instruction to add the order to be completed. Available options are:

- Only add as new BBO
- Only join new visible BBO or create new BBO
- Only add to 2nd visible price point or better visible price point
- Only add to 3rd visible price point or better visible price point

On submission, a Passive Only order will match with any contra Hidden Order at a price better than visible BBO. If the quantity remaining would have otherwise matched with a visible order, the remainder will be expired. If the remainder can rest on the book it will follow the instruction laid down above. Where the instruction above can not be followed the remainder of the order will be expired.

Where the passive order indicator is selected for a hidden order, only the first option (only add as a new BBO) may be selected otherwise the order will be rejected on submission.

Passive Only Order indicators are ignored on the following orders:

- ALL orders submitted during an auction;
- Market orders
- Pegged orders
- Pegged Limit orders
- Stop orders
- Stop Limit orders

6.5 **Minimum Quantity at Touch**

During ***Regular Trading*** in selected sectors, for non-FTSE350, equity securities on SETS, an incoming passive order must be at least a prescribed percentage of the securitity's **Exchange Market Size** (EMS) to set a revised Best Bid / Offer (BBO). The specific sectors that Minimum Quantity at Touch applies to and the relevant percentage of EMS is set out in the ***Millennium Exchange Business Parameters.*** The key characteristics where Minimum Quantity at Touch is in force:

- All auction and aggressive orders, along with passive orders (and order amendments) that are priced at touch or less competitively will be accepted and processed;

- It does not operate during any auction phase;

- Incoming passive orders with a quantity of less than the prescribed percentage of EMS that would otherwise create a new BBO will be rejected on entry;

- the validation is applied on the full order size on entry. Orders that partially aggress on entry will continue to execute. If the rump would otherwise create a new BBO, it will be expired unless the original order size on entry was greater than prescribed quantity;

- order amendments that generate an aggressive (immediate) execution will be processed, If the rump of the order would otherwise create a new BBO, it will be expired unless the amended order size on entry was greater than prescribed quantity;

- an order amendment that does not generate an aggressive execution will be rejected, if it would otherwise create a new BBO, unless it was greater than prescribed quantity

- orders that are already present on the order book and are not amended are never re-validated. This includes orders that persist into subsequent trading days.

6.6 **Cross Order and Block Trade Facility**

Participants can use the Cross Order functionality to enter an already agreed/identified trade to the trading system. The Cross Order functionality consists of two types: Cross Orders and Block Trade Facility (BTF).

If the trade is agreed or identified within a single member firm, it will be considered as an "Internal Cross/BTF" whereas if the trade is agreed or identified by two different member firms, it will be referred to as a "Committed Cross/BTF".

In the case of a Cross Order, the price of the order must be within the visible best bid price and the visible best ask price (inclusive) shown in the order book at the time the Cross Order is submitted by the member firm.

If the order is a BTF, the price of the order must be at or within the following spread. Where the relevant parameter is set out in the ***Millennium Exchange Business Parameters:***

> Visible best bid - a configurable percentage AND visible best offer + a configurable percentage.

Participants should note that once an "Internal Cross Order" or "Internal BTF" is accepted, that will not be added to the order book (hence not communicated via market data feeds). The two sides will immediately be matched as per the normal matching rules and the resulting trade will be sent to the Participant who entered the order.

In case of an incoming "Committed Cross Order" or "Committed BTF", the system will look for a corresponding Cross Order with the same Cross ID in the system. If not found, the Cross Order will be cached without adding to the order book (hence not communicated via market data feeds). Once the other corresponding Cross Order is submitted to the system, the two orders will immediately be matched as per the normal matching rules and the resulting trade will be sent to the Participants.

6.6.1 Cross Order Behaviour

Cross Orders are allowed only during the Regular Trading session. If submitted during any other session, a Cross Order will be rejected.

The last traded price (LTP) and Dynamic Reference Price (DRP) is not updated by a trade resulting from Cross Orders. Circuit breaker validations will not be applied based on the price of Cross Order trades. Furthermore, Cross Order Trades cannot trigger a circuit breaker.

Cross Order trades will not be considered for any closing price calculation. Cross Order trades will update the following statistics: On-book volume, Number of Trades, Turnover and Trade High/Low. They also update All Trades Volume, VWAP, Number of Trades, Turnover and Trade High/Low.

The opening Price will not be updated by a Cross trade.

6.6.2 Block Trade Facility Behaviour

BTFs are allowed only during the Regular Trading session. If submitted during any other session, a BTF order will be rejected.

The last traded price (LTP) and Dynamic Reference Price (DRP) are not updated by a trade resulting from BTF Orders; hence the circuit breaker validations will not be applied based on a BTF trade.

BTF trades will not be considered for any closing price calculation. BTF trades will update the following statistics: All Trades Volume, VWAP, Number of Trades, Turnover and Trade High/Low. They also update Off-Book Trade High/Low.

The Opening Price will not be updated by a BTF trade.

6.7 **Order management**

6.7.1 Order modification

The following aspects of orders present in Millennium Exchange, whether parked or in the order book, may be updated by participants:

- order size
- order price (where applicable)
- date and time validity (where applicable)
- client ID

Modifications of an order may result in a change in its price and/or time priority and public order code as set out in the table below.

Table 9: impact of order modification on order priority

Modified field	Modification	Impact on priority
Order size	Iceberg orders increase in order quantity but display quantity not increased	No impact
	Increase other orders	Loses time priority
	Decrease	No impact
Order price	Improve	Gains price priority Loses time priority
	Worsen	Loses price priority Loses time priority
Date and time validity	Any change	No impact
Client ID	Any change	No impact

6.7.2 Unilateral cancellation of live orders by London Stock Exchange

Prior to invocation of the Post Close Session, London Stock Exchange will usually cancel live orders where a participant is changing its user configuration or a security has one or more of the following changes effective from the start of trading on the next business day. Where this action is completed prior to the invocation of the Post Close session, a corresponding cancellation message will be sent to the specific participant:

- TIDM
- ISIN
- Trading segment code
- Trading currency
- Country of Register
- Load ID (Trading System partition)

London Stock Exchange reserves the right to cancel live orders where it considers necessary in addition to those set out above.

Under other circumstances live orders will be cancelled by the London Stock Exchange without a corresponding confirmation being sent to participants These include but are not limited to the following examples:

- After the invocation of the Post Close Session in securities that are due to be cancelled the following trading day
- Other reference data changes undertaken after the invocation of the Post Close Session e.g. a clearing arrangement becomes invalid[15]
- Following loss of the Primary Site (see Section 10)
- Partial loss of a Matching Engine requiring London Stock Exchange to re-start processing from a previous known point

In order to ensure that participants are fully aware of the above, participants should request an Own Order Book Download daily to confirm the current state of the order book.

6.7.3 Authorised Persons List (London Stock Exchange Rule 1500)

London Stock Exchange maintains a list of personnel at a member firm who are authorised to request London Stock Exchange to cancel live orders from the trading system on their behalf in the event of a system problem which prevents the participant from accessing the order book.

If you require confirmation of who is currently authorised, please contact Market Operations:

- **msu@lseg.com**
- STX 33666 / telephone + 44 (0) 20 7797 3666 (option 1)

6.7.4 Market Orders and first day of trading

On the first day of trading in an instrument, if there are only Market Orders on the book at the opening uncrossing, then no execution will occur and any Market Orders will be expired after the auction. For all other days where only Market Orders exist on the order book, they will execute at the previous closing price.

[15] This will be under exceptional circumstances

6.7.5 Specifying ClOrdID

Participants should ensure that ClOrdID is unique for a trading day across a CompID / TraderGroup and for the life of an order. For performance reasons MIT Exchange will not carry out any duplicate detection based on ClOrdID. Should a participant re-send an order with the same ClOrdID that has previously been used then it **will** be processed. In this situation and to guarantee that orders can be successfully managed it is recommended that customers use OrderID when modifying active orders.

Participants should also ensure that their ClOrdIDs are unique across trading days (e.g. embed the date within the ClOrdID).

6.8 Settlement Account Types

When the Account Type is mandatory for a market, it must be specified as either 'Client' or 'House' on all orders.

7.0 Order Book Execution

7.1 **Trade types**

The trade type indicator generated automatically as a result of an order book execution varies according to the type of trading session in which the execution occurred.

Table 10 – Order Book Execution trade types

Trade Type	Description
AT	Automatic Trade – order book trade resulting from regular trading session.
UT	Uncrossing Trade – order book trade resulting from the out-turn of an auction match.
PT	Closing Price Crossing Session trade – order book trade resulting from the session that takes place after the closing auction has generated the day's closing UT. Executions can only take place at day's closing auction price.

The full range of trade types are contained in the ***Millennium Exchange Business Parameters*** document

7.2 **Auctions**

Auctions are intended to concentrate liquidity at these specific key times. Auctions occur as follows:

- London Stock Exchange's order book trading day commences with an opening auction
- if a security in regular trading breaches its price monitoring it will enter an auction call period
- the closing price is generated from the closing auction process
- FTSE 100 securities have an expiry auction at 10:10 on the third Friday of the month and FTSE 250 securities an expiry auction at 10:10 on the third Friday of March, June, September and December

At the commencement of an auction call, all orders that have been parked for that specific auction will be injected immediately. Orders may be entered, modified and cancelled during an auction call, (along with any extensions and random periods) but no automated execution occurs. Throughout the entire period London Stock Exchange disseminates the most up to date indicative auction price and uncrossing volume. This will be updated whenever orders are added, deleted, modified and result in a new auction price / volume.

Before an auction generates an execution it will check whether:

- a market order extension should be invoked;
- whether a price monitoring extension should be invoked; and
- whether any volume check prevents the execution taking place.

To avoid participants knowing the exact time of uncrossing a configured random period precedes invocation of each extension and the final uncrossing.

7.2.1 Market order extension

A market order extension is triggered when at the end of the call period (or any preceding auction extension period) the indicative auction match price would result in market orders (un-priced) remaining unexecuted on the order book.

The market order extension consists of an extension to the call period of a configurable amount of time.

7.2.2 Price monitoring extension

A price monitoring extension is triggered when at the end of the call period (or any preceding auction extension period) the indicative auction match price is greater than a configured tolerance away from the dynamic reference price (see below).

The price monitoring extension consists of an extension to the auction call period of a configurable amount of time.

The extra time a price monitoring extension draws attention to a potential price movement, giving participants the chance to review the prices of the orders that have been entered and if appropriate add, delete or amend.

7.2.3 Uncrossing algorithm

The execution price generated for an auction will be the price that:

- maximises the executable volume
- if more than one execution price would result in the same executable volume, minimises the surplus volume at the execution price
- if more than one execution price would result in the same surplus volume at the execution price, reflects the balance of pressure on the order book
- if the balance of pressure on the order book is even, reflects the reference price in the security
- if there is no reference price, is the lowest price

7.3 **Regular trading price monitoring**

Order books can be subject to rapid price movements. Millennium Exchange operates price monitoring functionality that tracks the prices at which automatic executions are due to occur and will halt regular trading / delay an auction execution if certain price movement tolerances would be breached.

The presence of price monitoring functionality in Millennium Exchange does not remove the requirement for participants' systems to have adequate safeguards in place to avoid erroneous order inputs.

If the price of a potential execution is more than a defined percentage above or below the applicable reference price(s) then no executions at that price will occur. Instead automatic execution will be temporarily suspended and an auction triggered, to allow the security's price to re-form in an orderly fashion and then be returned to regular trading as above.

If the automatic execution suspension period is triggered mid way through the execution of a persistent order, any residual volume is added to the order book.

Non-persistent orders with a Time In Force fill or kill (FOK) that would otherwise breach a price monitoring threshold will be rejected and no automatic execution suspension period will occur.

Non-persistent orders with a Time In Force of immediate or cancel (IOC) that would otherwise breach a price monitoring threshold, are able to generate executions up to but not including the first price that breaches a price monitoring threshold. At this point an automatic execution suspension period is triggered and all remaining volume of the IOC is eliminated.

In regular trading 2 reference prices are relevant:

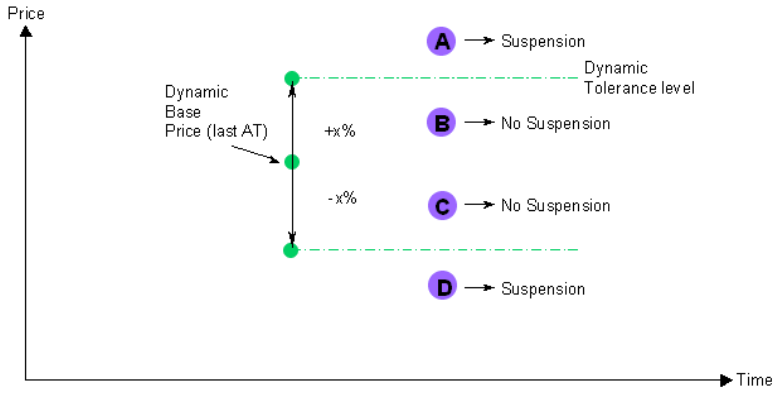
- the dynamic reference price is the last order book execution price (or previous closing price if more recent) prior to the submission of the incoming order; and

- the static reference price is the most recent auction price from the current day. Where that auction did not generate an execution, the next automated trade that follows the auction will be adopted instead.

London Stock Exchange may also set reference prices manually if required. This may be done for a new instrument or following a transfer to a new segment or corporate action.

The figure below shows how a dynamic reference price will generate a suspension according to the price of the incoming order.

Figure 5 : Illustration of breach of price tolerance level



7.4 **Detailed thresholds**

The number, duration and thresholds applicable to auction calls, market order, price monitoring and random periods continue to be managed from a business perspective at trading sector level. Generally, more liquid securities have lower thresholds and less liquid securities have higher thresholds. These thresholds are set out in full in the ***Millennium Exchange Business Parameters*** document.

7.5 **Contra of automatic trade reports (Rule 2110)**

A contra may be requested by one party to an automatic trade. For electronic executions in CCP securities, due to counterparty anonymity, agreement to contra can only be secured by London Stock Exchange's Market Supervision team intermediating. For non-CCP executions the member firm may contact its counterparty directly.

Member firms are under no obligation to contra a trade at the request of a counterparty.

Same day contras

The party wishing to contra the trade must submit a contra request to London Stock Exchange using the cancel trade message. On receipt of a request, where the counter-party is unknown to the requesting party, Market Supervision will contact the requesting party to ascertain the reasons for its submission. Market Supervision may then contact the matched buyer or seller to pass on the contra request from the initiator. If the other party agrees to the reversal of the trade it must itself submit a contra request.

Once a contra request has been received from both parties a delete trade report is generated.

Contra after trade date

Contra request messages will not be accepted by Millennium Exchange after the trade date. Should a member firm wish to reverse a trade after that date it should contact Market Supervision on STX 33666 (+44 20 7797 3666) option 2, who will liaise between the two counterparties and advise whether each party is prepared to drop its anonymity and contra the trade. Any contra trade resulting from the request will be published to the market using manual trade type PC as an exact reversal of the original trade. The responsibility for submitting the contra trade report should be in accordance with standard manual trade reporting responsibilities as specified by the Rules of the London Stock Exchange.

This PC trade should be settled bilaterally by the two parties to economically reverse the original AT that will clear and settle as normal.

7.6 **Use of trade identifiers for transaction reporting**

Millennium Exchange generates a number of execution identifiers that are included on the Execution Report sent to participants following an automatic trade. However, only the Trade ID (Fix Tag 880 - TradeMatchID) is guaranteed to only consist of upper case characters and digits.

Customers should be aware of this if they wish to use one of these identifiers as a UTRF (Unique Trade Reference) on transaction reports submitted via a reporting ARM where there may be restrictions to the character set supported.

8.0 Off Book Trade Reporting

8.1 **Trade reports (Rule 3040)**

Trade reports are automatically generated by Millennium Exchange for electronic executions on an order book.

Where the trade is executed away from an order book (but possibly still in an order book security) a 'manual' trade report must be submitted to Millennium Exchange in order to bring the execution 'on Exchange'. Manual trade reports can also be submitted to London Stock Exchange in its capacity as an OTC or Systematic Internaliser trade reporting venue (TDM). Participants define the status of their manual Trade Report through the use of Trade Type.

Currently only a single sided manual trade reporting model is supported by London Stock Exchange. One of the two parties who participated in the trade will report both sides of the trade to the system. The trade will be reported using the Trade Capture Report (AE) message. Upon receiving the trade report, the system will validate the trade report and will acknowledge or reject the trade report. The acknowledgement/rejection will be reported to the initiator and the counterparty through Trade Capture Report Ack (AR) message.

Each trade that is being reported will have the information as set out in Table below.

Table 11 – Off Book trade report fields

Information	FIX Field
Symbol	Symbol (55)
Trade type	TradeSubType(829)
Price in currency for Symbol as per trading system	LastPx (31)
Size	LastQty (32)
Optional currency if not currency for Symbol as per trading system	SettlCurrency(120)
Optional price if execution currency not same as currency for Symbol as per trading system	Original Price(20100)
Settlement date	SettleDate (64)
Size anonymity	Not valid for Exchange users
Date / time of trade execution	TransactTime (60)
Reporting party	PartyId (448)
Contra party	PartyId (448)
Reporting trader	PartyId (448)
Capacity of the trade	OrderCapacity (528)
House/Client	AccountType (581)
Bargain Condition	TrdType (828)

The ***Millennium Exchange Business Parameters Document*** sets out:

- the operation hours of the trade reporting system
- the different manual Trade Types and the trade condition available
- which counterparty is responsible for trade reporting
- the mapping of trade types to Execution Venue (Venue ID), which publishes to show where the trade was executed
- the manual price validation in operation
- the publication delay that is permissible

Trade reports are published in accordance with the trade type selected and the publication criteria in operation for the relevant security. Executions that do not qualify for a delay will publish immediately regardless of the trade type selected.

8.1.1 Dealing capacity

The Dealing Capacity (either "A" for agent or "P" for principal) must be specified on any trade report submitted by a participant. The counterparty's capacity must not be included, otherwise the trade report will be rejected.

8.1.2 Other trade report criteria

The Trader Group must be specified on the Trade Report.

Once a trade is confirmed and has entered a delay period, the reporting party can initiate a pre-release request to publish the trade prior to the delay period.

All trade reports must be submitted with the price specified in the trading system currency for that instrument. However, if the trade was executed in an alternative currency, then this may optionally be specified on the trade report[16] together with the original price in that alternative currency. Where a trade is done in an alternative currency and this reporting option has not been followed it **must** instead be reported with a reporting condition[17] of "Special-Priced Trade" (as well as the price in the trading system currency for that instrument).

A full description of Trade reporting messaging is provided in MIT204 - Post Trade Gateway Specification.

8.2 Amending / cancelling manual trade reports

The Rules of the London Stock Exchange require trade reports containing inaccurate data in certain fields to be promptly corrected.

[16] Specified in Tag 120 - SettlCurrency
[17] Tag 828 - TrdType

Off order book trades may be cancelled by mutual agreement between the counterparties and the associated trade report should be cancelled.

Trades are only retained on the trading system up to and including the day of publication. The process for cancelling or correcting a trade report therefore depends on the day the trade is due to publish.

When submitting an amendment before or on the day the trade is due to publish (or on the day of trade submission if trade is never destined to publish) the process is:

- cancel the original trade report by submitting a cancellation message using the original trade code
- if correcting, submit a new trade report containing the corrected details

When submitting an amendment after the day of publication (or after day of submission for trades that are never destined to publish) the process depends on the trading service and the original trade type entered:

- If original trade was a entered as a non publishing NM trade type, then a new trade report with trade type indicator 'NC' should be submitted containing the details of the original (incorrect) trade report. This cancellation will also not publish to the market
- If the original trade was entered as an OK trade type on either Gilts or Order Book for Retail Bonds (Gilts) (trading segments GILT or UKGT), then a new trade report with trade type indicator 'GC' should be submitted containing the details of the original (incorrect) trade report. This cancellation will then follow the same publication regime as the original trade
- For all other XLON trades submit a new trade report with trade type indicator 'LC' containing the details of the original (incorrect) trade report. For XOFF trade types submit a new trade type indicator 'OC', and for SI trade types submit a new trade type indicator 'OC'. Please note LC, OC and SC trade types publish to the market
- For all above, if correcting, submit a new trade report containing the corrected details

9.0 Additional Services

9.1 **Drop Copy**

Millennium Exchange provides functionality to support sponsored access – specifically 'Copy To' functionality by which a copy of Execution Reports generated by one trading user can be sent to a separate drop copy user, who does not have to necessarily be within the same firm. However, since only Execution Reports will be sent by Drop Copy, it should be noted that quotes are not supported.

A trading party may request a copy of all the order related execution report messages generated by the trading system for another trading user (parties) of the same firm or another firm if configured.

Full details of the Drop Copy Interface are given in MIT205 - Drop Copy Gateway Specification

9.2 **Own Order / Trade Book Download**

Millennium Exchange supports both the Own Order Book Download and Own Trade Book Download services.

All Trading customers are required to develop to and certify that their application can use the Own Trade Book Download service on the Post Trade Gateway. This is mandatory for all trading applications.

Own Trade Book Download only includes those trades that have occurred, have been published or are pending publication on the day of the request.

The Own Order Book Download is supported via the Drop Copy Gateway. In response to a request (sent via a Mass Order Status Request message) sent by a participant the gateway will return an Execution Report for each active order.

The Own Trade Book Download is supported via the Post Trade Gateway. In response to a request (sent via a Trade Capture Report Request message) sent by a participant the gateway will return a Trade Capture Report for each trade[18] that has occurred that day for the Firm. It is possible to configure so that download is restricted to pre-assigned specific FIX CompIDs.

Full details of the Own Order Book Download service are given in MIT205 - Drop Copy Gateway Specification.

Full details of the Own Trade Book Download service are given in MIT204 - Post Trade Gateway Specification.

[18] Participants can request automatic, off-book, cancelled or all trades

10.0 Recovery Model

The recovery model in case of serious incident is described below.

10.1 **Connection**

Each participant connection (identified by CompID) will be enabled for access to the trading system via a Primary and Secondary Gateway for each interface:

- FIX Trading
- FIX Post Trade (2 connections, one for Post Trade, one for OTBD)
- FIX Drop Copy (2 connections, one for Drop Copy, one for OOBD)
- Native Trading (2 connection, one for real time messages, and one for recovery)

10.1.1 FIX Recovery

One of the pair of Gateways is designated the Primary, and the other Secondary. In the event of failure of the Primary Gateway participants should connect / logon via the Secondary gateway. Any attempt to logon to the Secondary gateway outside of any failure event will be refused.

In case of unexpected disconnection from the Primary Gateway participants should attempt to re-connect to the Primary Gateway a total of three times, with 3 seconds between each attempt before attempting to connect the Secondary Gateway.

Likewise, if there are further issues in connecting to the Secondary Gateway a total of three connections, with 3 seconds between them, should be attempted.

After six failed connection attempts (three on each Gateway) this may indicate a serious issue and London Stock Exchange should be contacted for guidance.

Both Primary and Secondary Gateways are duplicated at the Disaster Recovery Site.

10.1.2 Native Recovery

Customers are allocated two Gateways, one designated as the Primary and one as the Secondary. Although connections to the Secondary will be permitted customers should avoid unnecessary connections to the Secondary Gateway to guarantee the maximum performance.

In case of unexpected disconnection from the Primary Gateway then participants should connect to the Secondary Gateway.

Both Primary and Secondary Gateways are duplicated at the Disaster Recovery Site.

10.2 **Disaster recovery site**

Millennium Exchange operates in cold standby mode. In the event of total loss of the Primary Site London Stock Exchange will activate the Disaster Recovery Site. This procedure is expected to take in the order of 2 hours.

In the event of disaster then only those trades that have been sent to participants via a Trade Capture Report from the Post Trade Gateway can be guaranteed to have been sent to clearing and settlement (if applicable). Participants should disregard any trades for which only an Execution Report has been sent.

Once the Disaster Recovery Site is active then all order and quote books will be cleared down and the trading system re-started.

Participants should note that no updated Execution Reports will be sent identifying those orders that have been deleted.

Following this, participants will be asked to connect to the Disaster Recovery Gateways.

Order book securities will be reinstated in an auction call state. Securities for which this is not applicable (including non-order book securities) will be reinstated to a Pre-Mandatory Trading Session.

Following recovery to the Disaster Recovery Site it is recommended that all participants should:

- Carry out an Own Trade Download to confirm which trades have been sent to clearing and settlement

- Carry out an Own Order Book Download to confirm that no orders are currently active

10.3 **Exchange market intervention**

When a system issue impacting a wide sector of the market is identified, London Stock Exchange will undertake an initial assessment of its severity and impact on its Trading Services. London Stock Exchange has a number of actions it can take that will be enforced at instrument, trading segment, trading cycle, matching engine partition or, if necessary, whole market level. Section 11 sets out London Stock Exchange's Protocol for the management of service interruptions.

10.3.1 Live Service Portal

The current system status of London Stock Exchange's services are displayed on its Live Service Portal. This is the mechanism for London Stock Exchange communicating any market intervention actions it takes as result of a service interruption. Participants can also register to receive both SMS text and e-mail notification of status changes of the portal which can be found at:

http://liveservice.londonstockexchangegroup.com/en/

10.3.2 Market situation options (Rule 1520)

Table 12: Overview of different intervention options Exchange may take

Intervention	Impact	Dissemination Mechanism
Regulatory Suspension Usually enforced at a security level as result of the temporary removal of the issuer's primary listing / admission	• Closing prices frozen and disseminated • No automatic execution • All current orders / quotes automatically cancelled • No further order / quote entry permitted • No indicative uncrossing prices • On Exchange off book trade reporting only allowed in accordance with para 1513 of the Rules of the London Stock Exchange Where a security is restored intra-day, there will be a 10 minute ***Resume*** auction call, which will be subject to random period(s) and extensions as required, the security will then transition to ***Regular Trading***. Where a security is restored on the same day as it was Suspended, it is the final closing price generated as part of the standard closing procedures that will be the official closing price for the security that day.	**XLON Instrument** Reference Data Package ENUM 1 Level 2-MITCH **Symbol Directory** message (status – S) message . Group Ticker Plant **Instrument Status** message
Regulatory Halt Usually enforced at a security level, where it is anticipated that the Halt will persist for more than one trading day.	• Closing prices frozen and disseminated • No automatic execution • All current orders / quotes automatically cancelled • No further order / quote entry permitted • No indicative uncrossing prices • On Exchange off book trade reporting only allowed in accordance with para 1513 of the Rules of the London Stock Exchange Where a security is restored intra-day, there will be a 10 minute ***Resume*** auction call, which will be subject to random period(s) and extensions as required, the security will then transition to ***Regular Trading***. Where a security is restored on the same day as it was Suspended, it is the final closing price generated as part of the standard closing procedures that will be the official closing price for the security that day.	**XLON Instrument** Reference Data Package. ENUM 3 Level 2-MITCH **Symbol Directory** message. (status – H) message Group Ticker Plant **Instrument Status** message

Intervention	Impact	Dissemination mechanism
Pause Short term interruption of regular trading which can be imposed at Instrument / Segment / Trading / market level	• No automatic execution • No indicative uncrossing prices • Orders can be entered / cancelled • No impact on closing prices • Off book trades can be entered / cancelled	Level 2-MITCH **Symbol Status** message. (status – l) message Group Ticker Plant **Instrument Status** message
Halt Interruption of regular trading and no further order entry which can be imposed at Instrument / Segment / Trading Cycle / market level	• No automatic execution • No indicative uncrossing prices • No further order / quote entry • Cancellation of existing orders allowed • No impact on closing prices • Off book trades can be entered / cancelled	Level 2-MITCH **Symbol Status** message. (status – H, Halt reason - space) message. Group Ticker Plant **Instrument Status** message
Market / Partition Suspension Market or Partition wide suspension of automatic trading and quote dissemination	• Total lockout - messages rejected at Trading Gateway(s) • No execution • No indicative uncrossing prices • No order or trade report entry or cancellation • No impact on closing prices • Off book trades can NOT be entered / cancelled	Level 2-MITCH **Symbol Status** message. (Status – H, Halt reason – 9999/9998) message Group Ticker Plant **Instrument Status** message
Halt & Close Regular trading disabled and closing prices issued. Very unlikely that there will be further automated trading that day. Can be imposed at Instrument / Segment / Trading Cycle / market level	• Closing prices frozen and disseminated • No automatic execution • No indicative uncrossing prices • No further order / quote entry • Cancellation of existing orders allowed • No indicative uncrossing prices • Off book trades can be entered / cancelled	Level 2-MITCH **Symbol Status** message. (status – H, Halt reason - space) message Group Ticker Plant **Instrument Status** message

11.0 Service Interruptions Protocol

The term “outage” is used in this section to describe a significant, unforeseen interruption to London Stock Exchange’s customer facing critical IT systems – usually the trading or market data systems. Outages may result from either technological failure or from a physical security/safety issue and will vary in length and severity of impact on the market and its participants.

When an issue is sufficiently serious to constitute an outage, London Stock Exchange will endeavour to follow this outage protocol in its handling of the situation. This protocol should be read in conjunction with the Recovery Model section of this document. For market data information please see MIT303 (MITCH) and GTP002 (GTP).

11.1 **Overarching Principles**

In managing outages London Stock Exchange will seek to act in the interests of all market participants and of the wider market. London Stock Exchange will generally seek to keep its markets open even if it has serious system issues. However, if London Stock Exchange considers the orderliness or fairness of our markets and/or the wider market to be impaired by the incident then London Stock Exchange will intervene to pause, halt or suspend the affected market(s).

London Stock Exchange always welcomes feedback from market participants that have been affected by outages – this will be used to improve the handling of any subsequent incidents and to amend this protocol as necessary.

11.2 **Different Types of Outage**

Since outages can be caused by a variety of different situations it is difficult to be specific or prescriptive about how any particular situation will be managed. Some examples of the causes of outages are:

- Failure/malfunction of significant components of the trading system
- Sustained or repeated loss of connectivity between customers’ systems and London Stock Exchange’s systems
- Major delays or gaps in the dissemination or receipt of market data

London Stock Exchange will use its judgement to decide how best to manage any particular outage and is mindful of the fact that many but not all market participants are now able to trade securities on other trading venues.

11.3 **Assessment & Response**

London Stock Exchange has a comprehensive internal escalation process to identify and manage its system issues. Most of these system issues are very minor and are entirely invisible to market participants. However, in the unfortunate event that we experience a major

service interruption (an outage) we will invoke our incident management procedures and form an incident management team, which is responsible for deciding on the appropriate response to the outage. Please refer to Section 10 of the Guide to the Trading System for further information. Paragraph 1520 of the Rules of the London Stock Exchange also provides some additional guidance on London Stock Exchange's use of market interventions.

In the event of an incident, London Stock Exchange's Live Service Portal will commence operation (see section 10.3.1). Upon invocation, the Live Service Portal will automatically disseminate both an email and SMS alert to registered clients. This automated alert will refer clients to the Live Service Portal and it should be used as the primary source of information until complete resolution of the outage is achieved. Participants may also continue to use their existing account manager contacts at London Stock Exchange during such outages.

11.4 **Market Interventions**

Once an outage has been identified London Stock Exchange will undertake an initial assessment of its severity and the likelihood of an immediate resumption of service. If a resumption of service is not imminent then the incident management team is likely to decide to intervene in the affected market(s). The following are the main market intervention options, one or more of which are then likely to be implemented:

11.4.1 Pause

If an immediate resumption of service is thought unlikely London Stock Exchange will place the affected market(s) in a Pause state while its assessment of the situation continues. This state is similar but not identical to an intraday auction phase, in that order entry and deletion is possible and updates to the order book are disseminated. However, unlike an auction, no indicative uncrossing price is disseminated when the market is in Pause state. In addition, the instrument status will be updated to reflect the Pause state.

The Pause state should generally not last more than 20 minutes from the point it is invoked. If it appears to London Stock Exchange that the outage will not be resolved within that 20 minute period London Stock Exchange will usually proceed to either Halt or Suspend the affected market(s).

11.4.2 Halt

If the Pause state has continued for 20 minutes or is no longer appropriate (or London Stock Exchange specifically wishes to prevent further order entry) then it will place the market in a Halt state, which does not allow the entry of new orders. The order book will continue to update when orders are deleted.

11.4.3 Market / Partition Suspension

If London Stock Exchange determines the outage is likely to be very severe or long-lasting and particularly if it wishes to suspend all order entry and deletion, then a Suspension/System Halt will be invoked at either Market or Partition level. For the securities impacted, no best price will be disseminated and the order book will remain static.

11.4.4 Halt & Close

This state will be used if London Stock Exchange concludes that there is no prospect of trading

resuming on the trading day of the outage. A closing price for the affected securities will be set and disseminated. The affected security(ies) will not then reopen until the next trading day.

11.5 **Alternative Site Procedures**

If the outage relates to a hardware failure or environmental incident in London Stock Exchange Primary Data Centre, the incident management team may decide to invoke the secondary site in order to utilise London Stock Exchange's backup hardware at the Secondary Data Centre.

The likely delay between the invocation of the secondary site and restoration of trading is difficult to forecast exactly but is likely to take in the region of 2 hours. Once trading resumes at the Secondary Data Centre, London Stock Exchange's electronic order books will be wiped clean and participants are encouraged to perform an own order book download in order to prepare themselves for the resumption of trading. Importantly, if there has been a significant interruption of service (defined by whether the incident team has been deployed) London Stock Exchange will always restore trading using an auction where at least 20 minutes notice of uncrossing will be given.

London Stock Exchange undertakes regular tests of its secondary site procedures in order to check the technical performance of the system, the readiness of Exchange personnel and to ensure that participants are familiar with the operation of the procedures.

11.6 **Resumption of Trading**

Once the outage has been resolved by London Stock Exchange, the market will be restored to normal service. Order-driven securities will recommence with an auction call where a minimum of 20 minutes notice of uncrossing will be given. Different markets may enter auction and uncross at different times – the specific auction duration and uncrossing times will be communicated at a market level. Order books will not be automatically cleared down prior to the auction. Quote-driven securities will recommence with a pre-mandatory quote period, with these periods determined according to the specific circumstances of the outage. During an outage all updates on the timetable for the resumption of trading will be posted on the Live Service Portal and disseminated through email/SMS updates.

11.7 **Trade Reporting**

When the trading system as a whole is available but the market has been placed into one of the states detailed in section 11.4 (except Market / Partition Suspension) manual trade reports can still be entered and submitted to the trading system unless the connectivity of the individual firm in question is affected. In the Market / Partition Suspension state, trade reports cannot be submitted for trades in the affected securities.

Whilst in the process of invoking systems at the Secondary Data Centre there is no connectivity to the trading system so manual trade reports cannot be submitted, but normal trade reporting service will be resumed once the Secondary Data Centre systems are active. London Stock Exchange will communicate to firms if the publication of trade reports is affected by an outage; firms should note that in such a situation their ability to meet their regulatory obligations to report and publish trades immediately may be affected.

11.8 **Closing Prices & Indices**

In the event of a service interruption, London Stock Exchange has procedures in place to derive closing prices for affected stocks. London Stock Exchange also has contingency procedures for use in the event that an outage affects the FTSE futures expiry auction.

Table 13: Overview of the different London Stock Exchange intervention options.

	order book execution	order / quote entry	order / quote deletion	updates to order book displayed	dissem-inate closing price	manual trade reporting	FIX security status	MITCH symbol status
PAUSE								
order driven	suspended	yes	Yes	yes	no	yes – all securities	• tag 326 = 111	• trading status = I
quote driven	n/a	no	n/a	n/a	no			
HALT								
order driven	suspended	no	yes	yes	no	yes – all securities	• tag 326 = 2 • tag 327 = see MIT302 Appendix B	• trading status = H • halt reason = see MIT303 Appendix A
quote driven	n/a	no	n/a	n/a	no			
MARKET PARTITION / SUSPENSION								
order driven	suspended	no	no	n/a	no	not in affected securities	• tag 326 = 2 • tag 327 = see MIT302 Appendix B	• trading status = H • halt reason = see MIT303 Appendix A
quote driven	n/a	no	n/a	n/a	no			
HALT & CLOSE								
order driven	suspended	no	yes	yes	yes	yes – all securities	• tag 326 = 18	• trading status = c
quote driven	n/a	no	n/a	n/a	yes			

11.9 **Live Service Portal**

London Stock Exchange is committed to communicating with customers frequently during an outage and will provide as much information as possible in the circumstances. Given the unpredictable real-time nature of outages it is not possible for London Stock Exchange to guarantee how often communications will be issued but during an outage updates will normally be provided every time the situation changes with a minimum period between updates of 30 minutes.

London Stock Exchange has a dedicated Live Service Portal, which was introduced in September 2010 as a replacement for the Incident Website. This portal is the primary means of communicating with market participants and other relevant parties during an outage and allows clients to register for email and SMS service alerts. Updates posted on the Live Service Portal will always include an indication of when the next update will be provided. Currently, an email/SMS alert will be issued to inform the market that the Live Service Portal is active and should be utilised by all relevant parties.

When London Stock Exchange places the trading system in Pause, Halt, Market / Partition Suspension or Halt & Close states, this information should be shown on vendor screens with the relevant "Session" indicator and we recommend that firms' in-house systems are coded to recognise these indicators. Although this information should assist market participants, certain issues may affect the integrity of market data and as a result only the Live Service Portal should be relied upon as definitive for the most up-to-date information.

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