



London
STOCK EXCHANGE

SETSmm and Iceberg Orders

SERVICE & TECHNICAL DESCRIPTION



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1. Introduction

This document details two Exchange trading service enhancements - SETSmm and Iceberg orders that will be implemented on 3 November 2003 and 22 September 2003 respectively. It also details a small number of technical changes that the Exchange is implementing at the same time including enhancements to the Customer Development Service (CDS).

Customers with a technical interest in this service description should also be aware of a document that details the changes that we are introducing to the Exchange's Broadcast Data Group (BDG) configuration including the SETSmm changes. This document is called "Autumn Bandwidth Review - Service / Technical Guidance Note" which is available on our website in the technical library or can be found at:

<http://www.londonstockexchange.com/techlib/techguide.asp>.

The trading service enhancements are as follows:

- Introduction of "SETSmm"; a new trading service for FTSE 250 securities (and other mid-caps) currently traded on SEAQ that delivers a new market model using an electronic order book supported by market makers
- Introduction of a new "iceberg" order type for the Exchange's order driven markets. This order type will be available for all trading services that currently use limit orders

The following technical changes will also be implemented as part of this project:

- Introduction of ten new broadcast data groups to accommodate the introduction of SETSmm
- An increase in the bandwidth of broadcast data groups for SETS
- Enhancements to our Customer Development Service (CDS)

2. Scope and Readership

This document is split into the following main sections:

Section 4.1: SETSmm

- 4.1 is aimed at participants that are looking to use the new service for UK mid-caps, either directly or indirectly

Section 4.2: Iceberg orders

- Section 4.2 is aimed at participants who wish to utilise the new iceberg order functionality in both existing order driven services (SETS and IOB) as well as SETSmm

Section 5: Technical Changes

- Section 5.1 provides detail for the configuration of the new SETSmm service and is especially important for the people responsible for the operation and connectivity to the new service
- Section 5.2 details the technical changes for Iceberg Orders across the trading services affected

Section 6: Testing Services

- Section 6.1 details the customer testing accreditation policy
- Section 6.2 and 6.3 details SETSmm Conformance and re-alignment of CDS
- Section 6.4 and 6.5 details Iceberg Orders Conformance and CDS testing
- Section 6.6 details Participant test weekend

Appendix A: Message Types

3. Project implementation

3.1 Status

Following detailed discussions with market participants including existing market makers, brokers and institutional investors, the Exchange issued its proposal document for SETSmm in April 2003.

Various comments and discussions followed and these have, where appropriate, been incorporated into the final design set out in this document. The most significant changes following consultation are:

- Extending live date for SETSmm to 3 November 2003
- Introducing maximum spreads
- Extending the time period available for providing market maker prices to one minute

Also, iceberg order functionality has become an increasingly common part of electronic markets. The Exchange, whilst having scoped the functionality of iceberg orders some time ago, will now introduce this functionality on our order driven services (SETS, SETSmm and IOB).

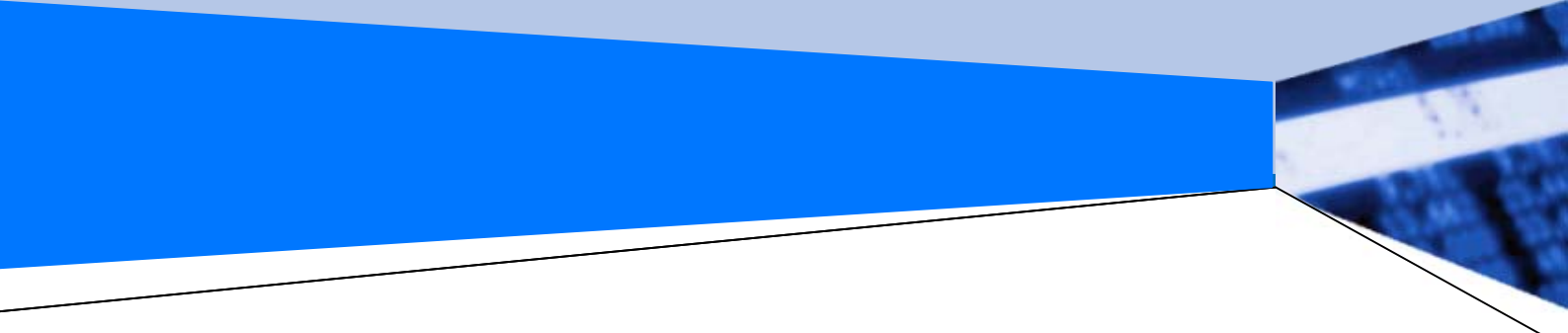
In addition to this document the following milestones will be key in the preparation for go-live:

- Technical and business seminars
- Details of the testing services available
- Rules consultation
- Rules confirmation
- Test service live

3.2 Project implementation - key milestones and dates

The key milestones and documents are:

- | | |
|--|----------------------------|
| • Service description | 16 June 2003 |
| • Rules consultation period | 16 June - 18 July 2003 |
| • Display and Derived Information Guidelines | TBC |
| • CDS and conformance available | 14 July - 31 October 2003 |
| • Rules confirmation | 04 August - 11 August 2003 |
| • Draft Migration & Instrument Details | 24 October 2003 |
| • Market maker registration deadline | 31 October 2003 |
| • Go-Live - Icebergs | 22 September 2003 |
| • Go-Live - SETSmm | 03 November 2003 |



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4. Business changes

4.1 SETSmm

4.1.1 Introduction

With the introduction of SETSmm the London Stock Exchange is making the benefits of SETS available to a wider range of mid-cap securities. These benefits will be delivered whilst maintaining the role of market makers, a key function in this market for the last 17 years.

In brief, SETSmm is a SETS-style order book supported by market makers for the most liquid securities currently traded on SEAQ.

This section (4.1) details the market model including the specific market maker elements and the more generic order driven functionality on which this structure is based. It also highlights some key data, transparency and post trade elements that customers who intend to use the service need to be aware of.

4.1.2 Background

When shaping the proposal the Exchange held close discussions with a wide user base. From these discussions and a wider review of the market structure it has become clear that:

- Member firms, and their clients are increasingly looking to execute business electronically
- New trading strategies looking to facilitate trading in alternative instruments (eg ETFs, CFDs) would benefit from having access to electronic trading in the underlying securities
- Liquidity in these securities is becoming increasingly fragmented thus weakening the central market price formation on which the integrity of our markets depends
- The basis for future market maker commitment is uncertain, partly because of difficult market conditions but more fundamentally because the use of risk capital is becoming increasingly selective

With the continuing support from market makers the Exchange believes that using a proven market structure (SETS) with a simple but essential enhancement (market making) will improve liquidity in these securities by increased participation.

4.1.3 SETSmm market model

SETSmm will have similar functionality to the SETS order book. The main difference is that price formation centres around a central order book with registered market makers entering market maker orders¹ (separate order type) providing two-way prices during the mandatory trading period (08:00 – 16:35)².

Market makers will continue to provide prices and liquidity throughout the trading day according to the same principles as today on SEAQ. Using orders instead of quotes to achieve this is an enhancement that increases brokers' access to these prices. Today brokers either need to phone market makers or use their proprietary RSP systems to execute their business. With SETSmm, brokers can also execute business using standard 'SETS orders' and have the option to improve on the best price available from market makers.

All business executed via the SETSmm order book will be covered by the existing Central Counterparty (CCP) Service for Equities with settlement netting.

4.1.3.1 *Security coverage*

The scope of SETSmm is primarily FTSE-250 securities currently trading on SEAQ but the new service will also be used for other suitable securities if appropriate, eg FTSE250 reserve stocks, some leading Irish securities etc. SEAQ will continue to provide the most efficient trading service for the remaining 2000 or so small to mid cap securities currently traded on this service.

Securities traded on SETSmm will be subject to the same quarterly reviews as are currently in place for SETS. New candidate securities will be considered for SETSmm eligibility according to similar criteria used for SETS, albeit with different parameters.

SETS securities will also be considered for SETSmm if liquidity weakens and trading of the security in question will benefit from the support of market makers.

Securities that are no longer able to attract electronic market makers on SETSmm will trade without registered market makers until the next quarterly review. However, if deemed necessary a security may be moved to another trading service before that time.

Further detail on the securities affected will be provided in a separate Service Announcement that will be issued in October.

4.1.3.2 *Access*

SETSmm can be accessed in four principal ways

- As a registered market maker (must be a member firm)

¹ This market maker order type is called "committed principal order" and is the set mechanism by which market makers maintain continuous two-way prices.

² These times will vary depending on when uncrossing in the opening and closing auctions occurs for each security.

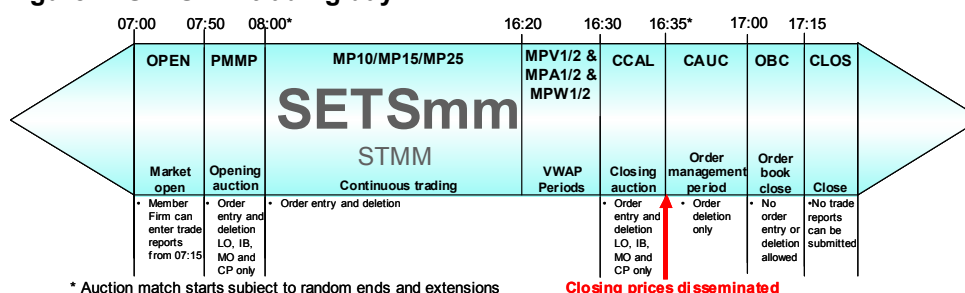
- As member firms with direct access to the order book
- Non member firms using a member firm's order routing facilities to enter orders
- Negotiating trades with the registered market makers (directly or via broker) based on prices available on SETSmm

Please note that London Stock Exchange membership is required to have direct access to the order book. A clearing relationship with the London Clearing House is also required, either directly or using a General Clearing Member (GCM).

4.1.3.3 Trading day

The SETSmm trading day commences with an opening auction, which can incorporate market order or price monitoring extensions, followed by a period of continuous trading, VWAP period and a closing auction.

Figure 1: SETSmm trading day



Description of these periods can be found in the Guide to Trading Services available on our website at <http://www.londonstockexchange.com/cmsattach/1645.doc>

4.1.4 Market making in SETSmm

Registered market makers in SETSmm will maintain a minimum level of liquidity thereby providing price reference and execution certainty even in difficult market conditions. Their obligations will be monitored and supported by the Exchange on the one hand and on the other incentivised by the introduction of a number of benefits.

4.1.4.1 Market maker benefits

The benefits of being a registered market maker on SETSmm are:

- Exposure rules
- Publication delays for particularly large trades and special reporting rules for worked principal trades offering improvement
- Statutory exemptions
- Tariff exemptions

4.1.4.2 *Exposure rules*

Where a member firm that is not registered as a market maker in a particular security proposes to execute an agency cross or riskless principal transaction away from the order book that is at or outside the best price supplied by the registered market maker, the member firm must expose that business to that registered market maker.

Where more than one market maker is displaying the same or better price on SETSmm than the price of the proposed cross, only the market maker with the best bid or offer price with time priority needs to be approached.

4.1.4.3 *Market maker publication regime*

A registered market maker in a particular SETSmm security will have the exclusive opportunity to have large trades in that security governed by special publication rules that aim to protect large risk positions taken on from a client or another member firm. There are two specific classes of transactions that are captured by these rules:

- Worked Principal Agreement (WPA); This allows for transactions of at least 8 x NMS to be worked throughout the trading day on behalf of a client and reported when 80% offset or at the end of the relevant trading day whichever comes first. Once reported these trades are published immediately
- Block Trade; A registered market maker can, when executing a particularly large trade on behalf of a client or another member firm, take advantage of an extended publication delay of three days (or 90% offset if sooner). The minimum size of the trade in order to qualify for this delay is 75 x NMS

NOTE: Reference to NMS means the full Normal Market Size, not the Minimum Submitted Order Size

There are certain basic conditions for the two trade types that enable a registered market maker to take advantage of this favourable publication regime:

- The market maker has to be registered as such in the particular security in which the trade is executed
- The trade is executed off the electronic order book
- The trade has to meet the stipulated criteria and reporting requirements as set out in the Rules (similar to existing WPA for SETS and Block trade regimes for SEAQ)

Please note that for the Block Trade regime there is no concept of different thresholds and delays depending on NMS level as is the case for SEAQ.

4.1.4.4 *Statutory exemptions*

Section 209 in the Companies Act requires any party to immediately disclose a shareholding of a UK company of three percent or more.

Under the Exchange's Rules, registered market makers disclose such substantial holdings to the Exchange on a Section 209 disclosure form within two business days

of the date upon which this interest was first held. The Exchange will publish these holdings, via RNS, in accordance with the thresholds below, on the day following receipt of the relevant disclosure notification. The thresholds for publication are:

- FTSE 250 securities - market maker holdings of 5% or more
- All non FTSE 350 companies - market maker holdings of 10% or more

In all above cases, any movement through a whole percentage point in the market maker holding will also be published if the overall holding remains above the publication limit (see Rule 2300 for more detail).

The registered market makers (as well as any other intermediary) can continue to apply for SDRT/stamp duty relief for all business reported to the Exchange, including any Irish securities traded via SETSmm.

4.1.4.5 Tariff

The normal trading charges apply to SETSmm as for other Stock Exchange business with the following exceptions for registered market makers:

- No transaction charge on executions resulting from a market maker order
- No order entry/deletion/modification charge on maintenance of market maker orders
- Where a market maker is already registered for SEAQ as a market maker the equivalent SETSmm service charge will be waived

4.1.4.6 Market makers' obligations

In summary the registered market makers on SETSmm have the following obligations:

- Provide two-way prices throughout the trading day, including during intra day and closing auctions
- Prices provided must be in a minimum size and will by its nature be available for electronic execution by any other qualifying member firm of the Exchange.

Please note that there is no requirement for the market makers to deal away from the order book. Prices displayed on SETSmm are only for electronic execution.

Market makers can only meet their obligations by using a special non-anonymous order type, the Committed Principal order. The detailed obligations surrounding the use of this order type on SETSmm are described below.

Mandatory quote period and refresh rate

Market makers are obliged to quote two-way prices:

- From within 60 seconds of the individual securities coming out of uncrossing in the opening auction until
- The end of the closing auction at 16:35+; and
- Refresh the bid, offer or both within 60 seconds following full execution, deletion, expiration or when changing the price of the order on the bid and/or offer side

Please note that random end times and potential extensions will mean these times will differ from security to security. Due to possible price monitoring and market order extensions, market makers may be obliged to maintain their prices until 16:50 in individual securities.

A market maker's obligation remains unaffected by any intra-day price monitoring auctions ie market makers' prices need to be available throughout this five-minute period.

The refresh period of 60 seconds is transitional in nature to allow for market makers to determine the optimal manner in which to update prices. The refresh period will be reduced to 30 seconds in February 2004.

Maximum spreads

The difference between a registered market makers' buy and sell orders (non-anonymous market maker orders only) will be subject to the maximum spread rule. This rule differentiates between two bands and securities will be allocated to their respective band based on actual spreads by market makers during a predefined period ahead of the live date.

The maximum spreads cannot exceed:

- **Band 1:** the greater of 10% of the previous day closing price or 3p (or Euro 0.03 if quoted in Euros), or
- **Band 2:** 5% of the previous day closing price

Eg if the closing price was 500p the maximum permitted spread in Band 2 is 25p. With a current mid price of 510p the market maker may quote a price of eg 509 – 534 if bidding for the stock.

Minimum Submitted Order Size and refresh size

As mentioned above market makers will be required to refresh either the bid, offer or both when the order size on either or both side(s) have been fully executed, deleted or expired or when changing the price of the bid and/or offer. On refreshing the order, the market maker must ensure that the displayed size is equal to the Minimum Submitted Order Size. The Minimum Submitted Order Size for SETSmm is 0.25 of the Normal Market Size (NMS).

Please note that if refreshing the bid price at the same level, there is no requirement to refresh the offer price as well. This is to avoid losing price and time priority on the offer side. The same concept also applies to refreshing the offer price.

Where there is a price change impacting both the bid and offer price, both bid and offer size must be refreshed to at least the Minimum Submitted Order Size. In this instance price and time priority may be lost.

If a market maker experiences technical problems preventing price updates, the Exchange must be notified immediately. The Exchange may temporarily suspend that market maker's dealing obligation until the problem is resolved.

4.1.4.7 *Market makers in auctions*

Registered market makers on SETSmm are required to maintain market maker orders as set out above during any auctions with the exception of the opening auction when there is no such requirement. In effect a market maker's quote obligation remains unaffected by any subsequent auctions (be it intra day or closing auctions) from the start of continuous trading (commences as soon as the opening auction ends) until the end of the closing auction.

4.1.4.8 *Fast markets*

In exceptional circumstances, market makers may experience problems updating their prices due to fast moving prices across the market. In these circumstances the Exchange may declare a fast market and any obligations on the market makers will be temporarily suspended.

4.1.4.9 *Market maker registration*

A member firm that wants to be registered as a market maker will need to provide the Exchange with details of the individual securities in which they want to participate. Please note that such member firms must be appropriately authorised by their regulator eg the Financial Services Authority, to participate as a market maker in this market.

An application to become a registered market maker in particular securities must be submitted to the Exchange by 13:00 on the business day before registration is set to commence.

Once registered, market makers cannot deregister from a security for three months and once a market maker de-registers they cannot re-register in that security for another three months.

Existing market maker registration and service charges will apply subject to exemption in section 4.1.4.5. Details of the current charges can be found on our website at <http://www.londonstockexchange.com/cmsattach/1380.pdf>

4.1.5 Order book functionality in SETSmm

SETSmm will use the same order book technology as SETS, with the addition of market maker orders for use exclusively by the registered market makers.

What differentiates SETSmm from SETS is that the market structure is supported by a rule-based regime that guarantees a minimum level of liquidity.

4.1.5.1 *Order types*

The order types that can be displayed on the SETSmm order book are:

- Market maker order³
- Limit order
- Market order
- Iceberg order

For information about iceberg orders please refer to Section 4.2 in this document.

Market maker orders function in the same way as limit orders with the exception that the identity of the originator (the market maker) will be displayed next to the price and size details of the particular order (both buy and sell side), wherever that order appears in the price & time queue on the book. There is no execution preference for this order type.

Non-persistent orders designed to take out existing orders on the SETSmm order book are:

- At best order
- Execute and Eliminate order
- Fill or Kill order

Table 2 summarises the order types which can be entered during the different periods of the trading day.

³ Referred to as Committed Principal order in the technical documentation and in the Rules of the London Stock Exchange.

Table 2: Summary of order entry requirements

ORDER TYPE	INFORMATION REQUIREMENTS	ENTERED DURING			
		AUCTION CALL	EXTENSION*	CONTINUOUS TRADING	ORDER MANAGEMENT
MARKET MAKER ORDER	<ul style="list-style-type: none"> • Originators identity • Buy or sell • Volume • Limit price • Dealing capacity • (Specified expiry time and/or date) 	✓	✓	✓	x
LIMIT	<ul style="list-style-type: none"> • Buy or sell • Volume • Limit price • Dealing capacity • (Specified expiry time and/or date) 	✓	✓	✓	x
ICEBERG	<ul style="list-style-type: none"> • Buy or sell • Total Volume • Limit Price • Dealing capacity • Peak Size • (Specified expiry time and/or date) 	✓	✓	✓	x
MARKET	<ul style="list-style-type: none"> • Buy or sell • Volume • Dealing capacity • (Specified expiry time and/or date) 	✓	✓	x	x
AT BEST	<ul style="list-style-type: none"> • Buy or sell • Volume • Dealing capacity 	x	x	✓	x
FILL OR KILL	<ul style="list-style-type: none"> • Buy or sell • Volume • (Limit price) • Dealing capacity 	x	x	✓	x
EXECUTE AND ELIMINATE	<ul style="list-style-type: none"> • Buy or sell • Volume • Limit price • Dealing capacity 	x	x	✓	x

*Market order and price monitoring extensions

Please note information requirements in brackets are optional or subject to configurable rules.

All these order types already exist on SETS (with the exception of iceberg orders); a detailed description of how these work can be found in the Guide to Trading Services available on our website at

<http://www.londonstockexchange.com/cmsattach/1645.doc>

4.1.5.2 Price monitoring

Price monitoring will be activated for SETSmm and based on a comparison between the next potential automatic execution price and a dynamic reference price. This comparison occurs before each individual execution of an incoming order. Price tolerance levels are a predefined percentage threshold either side of the dynamic base price.

Tolerances will be:

- 5% in the opening auction
- set depending on the maximum spread band for trading in the continuous trading period (including VWAP periods) for stocks with a share price above a set value as follows:
 - **Band 1:** 15% (stocks with a 10% or 3p/€0.03 maximum spread regime)
 - **Band 2:** 10% (stocks with a 5% maximum spread regime)
- 25% during continuous trading (including VWAP periods) for stocks with share price level below a specified level
- 5% in the closing auction

Please note that for FTSE 250 securities on SETSmm price monitoring will be switched off during LIFFE index expiries. For the FTSE 250 this normally occurs every quarter on the 3rd Friday of the respective months.

4.1.5.3 Auctions and auction extensions

Auction and auction extensions will operate in the same way as SETS, however the price monitoring tolerances will be as above. A detailed description of how these work can be found in the Guide to Trading Services available on our website at

<http://www.londonstockexchange.com/cmsattach/1645.doc>

One exception is the closing auction volume check in SETS. SETSmm closing auctions will not incorporate this check. In other words, there is no minimum required volume in the uncrossing should the auction price remain outside of price monitoring tolerances following all extensions.

4.1.5.4 Tick sizes

The tick sizes (price format codes) that apply to SETSmm are as follows:

'Z'	One one-thousandth
'L'	One four-hundredth
'K'	One two-hundredth
'J'	One one-hundredth
'Q'	Quarters
'H'	Halves
'W'	Whole

4.1.6 SETSmm market view

This section covers the key aspects of the prices and trading information available on SETSmm and other key market data.

Market data from the London Stock Exchange is available from our London Market Information Link (LMIL). There are three different levels of data:

- Level 1: Includes opening price*, mid, best bid and offer, trade high and low*, mid price high and low*, individual trades, closing prices, snapshot prices in real time, order book VWAP, all trades VWAP*, cumulative volumes, and uncrossing price and volume and daily official list prices
- Level 1 plus: Includes enhanced best price, buy/sell percentages* money flow per security*, time weighted average spread*, and level 1 data
- Level 2: Includes quotes and orders, level 1 and level 1 plus data

* Available from June 2003

4.1.6.1 Order book display

Below is a SETSmm example of the full market depth for a particular security.

Listed Company	LCPY	P Close	336	GBX
NMS 25,000	Segment STMM	Sector F25T	ISIN YVol	GB0009529859 1.00m
Last Prev	336 AT at 08:45 Vol 7,807 336 335AT 335AT 335AT 336AT			
Trade Hi	337	Open	336	Current 336 +0
Trade Lo	335	VWAP	335%	Current Hi 336 +0
Total Vol	107,899	SETS Vol	52,807	Current Lo 335 -1
BUY	TVol 109,537 MOVOL	Base 336	TVol 62,892 MOVOL	SELL
6	FIRM CMPY 59,082	336 – 336%	2,700	1
2	8,000 8,000	336	336%	2,700 2,700 1
CMPY	23,000 15,000	336	338	25,000 27,700 FIRM
2	34,082 11,082	336	338%	10,800 38,500 2
FIRM	59,082 25,000	336	339	25,000 63,500 CMPY
1	109,082 50,000	325	339	10,000 73,500 1
1	134,082 25,000	324½	350	1,000 74,500 1
1	135,082 1,000	300	365	7,000 81,500 1
			420	6,000 87,500 1

4.1.6.2 *Yellow strip and market depth*

The SETSmm yellow strip displays information regarding the current best buy and sell orders for the security. The prices displayed in the centre of the strip are the current best bid and offer for that security (best bid on the left, best offer on the right). The figure displayed on the far left and right of the strip is the number of orders that make up the volume at the best price and the volume itself is displayed between this figure and the best bid/offer.

Currently the SEAQ yellow strip indicates the best bid and offer, and the market makers who are making them. This will also be the case for SETSmm securities where the registered market maker participates in the best bid or offer (or both).

When a market maker order sits on the order book together with limit orders at the same price, the market maker order must be displayed separately. Furthermore, when two limit orders sit on the order book with the same price as a market maker order, one with a higher time priority and one with a lower priority than the market maker order, the two limit orders must also be displayed separately.

Please note as well that the hidden iceberg orders will not be visible on the order book and that the peak size will appear as a normal limit order on the screen.

4.1.6.3 *Reporting and publication*

All business executed in SETSmm securities must be trade reported to the Exchange within 3 minutes of the execution.

All trades executed through the order book will be published immediately, therefore there is no requirement to manually submit trade reports for these executions.

Only the registered market maker in a particular security will be able to delay the publication of large business for a defined period of time. Please see section 4.1.4.3. for details.

Any member firms trading a portfolio of securities where at least one is a SETSmm security can take advantage of the protected portfolio regime already in place for SETS. The main characteristics are:

- Portfolio must consist of at least 20 securities where at least one is a SETSmm security
- Reporting of such a trade can be delayed until the end of the trading day or until unwound, whatever is the earliest
- Once such a trade is reported it will publish immediately

4.1.6.4 *Closing prices*

Closing prices for SETSmm securities will be determined in the following priority:

- Price resulting from executions in the closing auction (please note that SETSmm uncrossing in the closing auction does not incorporate a volume check as is the case for SETS)
- If no trades from the above, the VWAP of automatic trades executed in the last 10 minutes of trading
- If no trades from the above, then the closing price will be mid of the best bid and offer at the end of the closing auction. Please note that the closing price will not be based on the last AT if that AT trade occurred prior to the VWAP period

The price coming out of the above process will be the official closing price for the individual securities. These will be available on our LMIL feeds and also published in the Daily Official List.

4.1.7 Post trade processing

4.1.7.1 *Central counterparty for equities*

All trades in SETSmm securities executed electronically on the order book will be included in the Central Counterparty Service for Equities offered in cooperation with the London Clearing House and CrestCo. Off order book trades will settle directly in CrestCo outside of CCP.

Member firms trading electronically on SETSmm will need to have a clearing relationship either directly with LCH or indirectly via a General Clearing Member (GCM). To support the guarantee offered by LCH as the CCP, margins will be required from direct members of LCH.

Please refer to our website for more information on the operation of CCP.

<http://www.londonstockexchange.com/techlib/techguide.asp>

4.1.7.2 *Netting*

Settlement netting allows participants to have just one net settlement per security per day with LCH, irrespective of the number of trades they had dealt. As with SETS, SETSmm will benefit from multi-lateral netting with LCH as the CCP. In this service therefore, the settlement of one (net) transaction may settle several underlying (gross) transactions.

4.1.7.3 *Contras*

For automatic trades on SETSmm, contra requests will be as they are on SETS.

A detailed description of how contras work can be found in the Guide to Trading Services available on our website at

<http://www.londonstockexchange.com/cmsattach/1645.doc>

4.2 Iceberg orders

This section sets out the use and behaviour of iceberg orders on the Exchange's order driven trading services. Iceberg orders will be available on SETS and the International Order Book (IOB) from 22 September 2003. Iceberg orders will be available on SETSmm from when this service goes live on 3 November 2003.

4.2.1 Background

Market participants with large orders to execute may be reluctant to expose these to the order book in their entirety because of the potential adverse market impact of doing so. Investors and brokers consequently adopt alternative trading strategies, including dealing away from the order book, splitting the order into smaller fragments, or drip-feeding the order into the order book using automatic entry facilities (often known as "tranching").

Introducing iceberg orders will facilitate such trading practices by offering the ability to execute such business in the central order book, thereby strengthening the market by concentrating liquidity.

4.2.2 Benefits of iceberg orders

By its nature iceberg orders allow the originator to only display a smaller part of a larger order in order to limit the market impact costs of that order. The benefits of iceberg orders over and above the use of existing automated input facilities (referred to above as 'tranching') are as follows:

- An iceberg order will increase the originator's execution capabilities by maximising volume executed in a single order book execution at the same price (tranching in an automated input facility will only result in the 'peak' size being executed).
- Customers looking to execute aggressively on the order book, eg using an At Best order, are more likely to achieve better prices when iceberg orders are available for execution as these will exhaust total iceberg volume before executing against orders further down the price queue).

To illustrate the above, consider the following example where a participant has entered an order to sell 100,000 shares at a limit price of 100p into a tranching facility. The participant has chosen to show the order in tranches of 10,000 shares. The order in bold in the order book below indicates the first portion of the tranche order.

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
50,000	99	100	500
25,500	98	100	10,000
		103	100
		105	20,000

Assume now that an at best order to buy 16,000 shares is entered. During execution, the incoming order will fully execute the first portion of the tranche order, and some of the sell orders at worse prices. Only once matching is completed, will the trading system send out execution confirmation messages to affected participants.

Upon receiving a message informing it that the visible tranche has been fully executed, the tranching facility will automatically submit another order to sell 10,000 shares at a limit price of 100. The order book will then appear as follows:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
50,000	99	100	10,000
25,500	98	105	14,600

Despite being willing to sell at a strictly better (in this case lower) price than the limit orders at 103p and 105p, the tranching response mechanism has allowed trading to pass through the limit price of the large order.

Since iceberg orders reside in the Exchange's system, the hidden volume of an iceberg order is included in the matching algorithm. This means that unlike the above scenario, trading cannot pass through a price limit of an iceberg order until all volume (including hidden volume) at that price limit has been satisfied. Specifically, the iceberg order has brought the following market efficiencies:

- The originator of the iceberg order would have had 15,500 executed as opposed to just 10,000
- The originator of the At Best order has traded all its volume at 100p at a consideration of £16,000 thanks to the iceberg order. This compares to £16,273 if no iceberg was present, a saving of £273 or 1.7% of total consideration.

4.2.3 How iceberg orders work

An iceberg order is an order that can be partially hidden from market view. Upon entry of the order, the participant must therefore specify the total order size and the visible "peak" size. The peak size is the maximum volume that will be shown to the market at any given instant. To maintain sufficient transparency in the market, a minimum peak size will be set, defined as a fraction of NMS for that stock.

The trading system will manage the iceberg order by automatically introducing new full peaks into the matching algorithm and order book following complete execution of a revealed peak. Each time a new peak enters the order book, it is assigned a new timestamp and behaves in an identical manner to a conventional limit order. Acquisition of a new time stamp means that the hidden volume of an iceberg order loses time priority to other (visible) limit orders at the same price. As described above, however, the total volume (visible and hidden) of an iceberg order retains continuous price priority over all other volume at a strictly worse price.

In the examples that follow, the peaks of iceberg orders are identified in bold to aid understanding. In practice, however, the visible peaks of iceberg orders will not be distinguishable from conventional limit orders.

4.2.3.1 Aggressive iceberg order entry

When an iceberg enters an order book aggressively, it will participate with its full volume. Any remaining volume of the order will then be shown to the market in peaks of a size specified by the participant.

Time	BUY Volume	Price (p)	Price (p)	SELL Volume	Time
8:20:25	50,000	99	100	10,000	8:20:32
8:24:09	25,500	98	100	7,500	8:22:57
			101	20,000	8:19:00

For example, an iceberg order to buy 100,000 shares at a price of 100p is entered at 8:25:00 into the above order book, and the participant has elected to define the peak size as 10,000 shares.

The iceberg order will enter the order book aggressively, immediately matching against the two sell orders at 100p. These trades are effected, and the remaining iceberg size is 82,500 shares. The first peak of 10,000 shares is then entered into the order book appearing as a conventional limit order. The order book will appear as below.

Time	BUY Volume	Price (p)	Price (p)	SELL Volume	Time
8:25:00	10,000	100	101	20,000	8:19:00
8:20:25	50,000	99			
8:24:09	25,500	98			

4.2.3.2 Passive iceberg order execution

Suppose now that an order to sell 10,000 shares At Best is entered at 8:25:32 in our previous example.

This incoming order will fully execute the visible peak of the iceberg. Once matching has occurred, the trading system will automatically refresh the peak in the order book, assigning it a new time stamp. Total remaining iceberg volume is then 72,500 shares – 10,000 of which are visible in the order book as below.

Time	BUY Volume	Price (p)	Price (p)	SELL Volume	Time
8:25:32	10,000	100	101	20,000	8:19:00
8:20:25	50,000	99			
8:24:09	25,500	98			

Multiple executions of an iceberg order on the order book will only generate a single trade message (5TG) for the iceberg participant (ie when an incoming order executes against the peak of an iceberg order and some or all of the hidden volume).

To show this, consider an order to sell 11,000 At Best which enters the above order book at 8:26:12. Since trading cannot pass through the price limit of 100p whilst there

is still some volume of the iceberg to be satisfied, the incoming order will match against the revealed peak of the iceberg order, and 1,000 shares of the hidden volume. The trading system will disseminate these trades in a single message (5TG), listing the separate trade codes.

The total volume of our iceberg order is now 61,500 shares, and the trading system must update the order book with the new peak of the iceberg. In the above example, the new peak will be 9,000 shares (peak size minus the 1,000 shares already matched of this peak) and the partially executed peak will retain price priority. It will only be refreshed when a subsequent execution takes the remaining peak size. The execution will refresh the peak and generate a new time priority. The order book will therefore appear as below.

Time	BUY Volume	Price (p)	Price (p)	SELL Volume	Time
8:26:12	9,000	100	101	20,000	8:19:00
8:20:25	50,000	99			
8:24:09	25,500	98			

Suppose that a second iceberg order is entered at 8:28:00 to buy 50,000 shares at a limit price of 100p, with a revealed peak size of 20,000 shares. To distinguish the iceberg orders, they have been labeled A and B. The first peak of the new iceberg (B) will be entered into the order book, which will now appear as below.

Time	BUY Volume	Price (p)	Price (p)	SELL Volume	Time
8:26:12	9,000 ^A	100	101	20,000	8:19:00
8:28:00	20,000 ^B	100			
8:20:25	50,000	99			

When there are multiple icebergs at a single price level, then the new peaks of the iceberg orders retain time priority amongst themselves. For example, if an order to sell 35,000 shares At Best is now entered at 8:30, then the visible peaks of both icebergs will be completely filled, and iceberg A will satisfy the remaining 6,000 shares of the incoming order.

The market will see two trade reports from this series of executions – one for 15,000 shares (against iceberg A), and one for 20,000 shares (against iceberg B). Once matching has been completed, new peaks of both icebergs are introduced to the order book, with iceberg A retaining priority over iceberg B.

Time	BUY Volume	Price (p)	Price (p)	SELL Volume	Time
8:30:00	4,000 ^A	100	101	20,000	8:19:00
8:30:00	20,000 ^B	100			
8:20:25	50,000	99			

4.2.3.3 Iceberg order participation in auctions

Iceberg orders participate in auctions, contributing their full volume to the matching algorithm. The volume visible to the market, however, will continue to be the visible peak volume. The indicative uncrossing volume message, however, will detail total

auction volume including that which is matched against hidden volume of one of more iceberg orders.

4.2.3.4 *Iceberg order modification*

Iceberg orders are eligible for order modification by order price, order size, participant order reference, date and time.

Order Price

If the order price is changed the order will lose time priority.

Order Size

The order size can be changed in several ways:

- If the order size is increased, the order will maintain time priority, the peak size will remain unchanged, and the hidden size will increase
- If the order size is decreased, and the resulting remaining total size is greater or equal to the current remaining peak size, the order will maintain time priority, the peak size will remain unchanged, and the hidden size will be reduced
- If the order size is decreased, and the resulting remaining total size is less than the current remaining peak size, the order will lose time priority and be refreshed with a remaining peak size equal to the remaining total size

Please note that it is not possible to modify the peak refresh size of the iceberg order (note, however, that the remaining peak size will be reduced if the total iceberg size is modified to a size less than the currently displayed peak).

Participant order reference, date and time

The participant order reference, date and time can only be modified if the price and/or volume is also changed. As this is a change to the visible order it will lose time priority.

4.2.3.5 *Iceberg order management*

The owner of the iceberg order will receive a “hidden” order code. This code refers to the order as a whole, and can be used to delete the remaining (total) iceberg volume. If the iceberg order is modified resulting in the displayed size changing, a new hidden order code will be generated.

Each new peak of the iceberg order will also be assigned a unique “visible” order code, seen by the market. Since this code is unique and varies with each new peak, market participants will not be able to tell that the successive peaks are part of the same iceberg order.

The owner of the order is the only participant knowing both the hidden and visible order codes, allowing them to retain full “view and do” capability.

4.2.4 Iceberg order charging model

The charges levied on executions with Iceberg Orders are under review and will be confirmed shortly. Once confirmed, the charging structure and levels will be added to this section of the document.

5. Technical changes

This section provides details of the technical changes required to support SETSmm and Iceberg orders. This functionality has been implemented to minimise the impact on market participants.

The different components within this release are not mutually dependent, allowing participants to support one, both or neither development as their needs require. This is a non-mandatory release.

In addition enhancements to the Customer Development Service (CDS) are also provided in this section.

5.1 SETSmm

SETSmm facilitates automated execution of orders using a central order book which is similar to SETS. A number of securities previously traded on SEAQ will now be traded on SETSmm. There is also a new segment, sectors and period names based on existing functionality, configured to support this market. The technical changes can be summarised as follows:

- 1 new market segment
- 13 new market sectors
- 10 new default period names
- 13 new temporary period names
- 10 new Broadcast Data Groups (BDGs)
- Approximately 225 securities moving from SEAQ to SETSmm*

* *Subject to change*

5.1.1 Trading

SETSmm is based on committed principal orders alongside all order types available on SETS. The Iceberg Order type, see section 5.2, introduced with this release is also valid for SETSmm.

Trading commences with an opening auction and may also incorporate market order or price monitoring extensions see Period Schedule information in Appendix B for more details.

Market Makers are required to enter two-way committed principal orders within 60 seconds of the end of the opening auction, as detailed in section 3.1.5.7. The random period at the end of uncrossing will be 0-60 seconds and will be followed by a **5SX** 'Uncrossing Completed' message.

Continuous trading combines mandatory committed principal and order book trading periods. During this period, committed principal orders – market mechanism type ‘CP’, with price, volume and participant identification (mnemonic) are visible on the order book, alongside all anonymous persistent order types.

Price monitoring is configured for this market with potential executions outside of the dynamic tolerance level causing either the aggressive order to be rejected or an Automated Execution Suspension Period (AESP) to be initiated.

The official closing price is generated from a closing auction. Where there is no uncrossing, the VWAP of the last 10 minutes trading is used. Where there have been no trades in this period, the mid price from the best bid and offer price at the end of the closing auction is used.

5.1.2 Advisory codes

SETSmm will generate existing advisory codes, no new codes have been created.

5.1.3 London Market Information Link (LMIL) Broadcast Data

SETSmm uses a dedicated set of broadcast data groups (BDGs) for reference data, Level 1, Level 1 Plus and Level 2 information, as described in table below.

Table 3 –SETSmm BDGs

BDG	Description	Bandwidth
B66	SETSmm Prices - Orders, deletes, uncrossing price, uncrossing complete plus market information messages.	132kbps
B67	SETSmm Trades – Automatic and manual trade reports	17kbps
B68	SETSmm Best Prices - Best price, closing price, uncrossing price plus announcement messages and change of ex-marker status.	111kbps
B69	SETSmm Enhanced Best Prices - Enhanced best price and uncrossing price and volume	132kbps
B70	SETSmm Trades VWAP – Trades VWAP	12kbps
B71	SETSmm Cumulative Volume – Cumulative Volume	12kbps
B72	SETSmm Opening Price - Opening price and Trades High/Low	31kbps
B73	SETSmm Money Flow – Buy/Sell Percentages, Money Flow and Time Weighted Average Spread	64kbps
B74	SETSmm Reference Data (Full)	3kbps
B75	SETSmm Reference Data (Changes)	3kbps

1 new market segment containing 13 new market sectors has been created to support the SETSmm market. There are 8 sectors for FTSE 250 securities and 5 sectors for non FTSE 250 securities. These are shown in **Table 4**

Table 4 –Market Segments and Sectors

Segment Description	Segment Code	Sector Code	Sector Description
SETSMM	STMM	SMM1	SETSMM MARKET 1
		SMM2	SETSMM MARKET 2
		25SM	SETSMM MARKET 3
		4SMM	SETSMM MARKET 4
		5SMM	SETSMM MARKET 5
		F25F	FTSE250 SECURITIES 1
		F25T	FTSE250 SECURITIES 2
		F25S	FTSE250 SECURITIES 3
		F25E	FTSE250 SECURITIES 4
		25FS	FTSE250 SECURITIES 5
		250F	FTSE250 SECURITIES 6
		250T	FTSE250 SECURITIES 7
		250S	FTSE250 SECURITIES 8

5.1.4 Migration of securities to SETSmm

A number of securities are migrating to SETSmm from SEAQ. The specific securities will be communicated prior to go-live via a Service Announcement. Customers should then use their Reference Data Service (Full & Changes) for the full details of the SETSmm securities, segments, sectors and period rules.

5.2 Iceberg orders

Participants wishing to utilise iceberg order functionality are required to submit a new version of the enter order message, and process a new version acknowledgement in reply. In addition to Iceberg orders the new message versions can also be used with all existing order types.

To minimise market impact with the introduction of iceberg orders, existing versions of order messages are still valid allowing full backwards compatibility. The technical changes can be summarised as follows:

- 4 new versions of existing message types
- 1 new Message Type
- 1 new Market Mechanism Type
- 2 new Advisory Codes

5.2.1 Order entry

A new version, 'AD', of the **5EO** 'Enter Order' message has been created to support iceberg order entry. As well as price and "total" size, participants must also populate the peak size field. The peak size is the volume of the order that is visible and appears to the market as a limit order, it will always be less than or equal to the total size of the Iceberg order. The total size minus peak size equals the amount of volume that is hidden from the market. When a peak is fully executed it is replaced by a new peak from the hidden volume until the iceberg is fully matched, modified or deleted.

On receipt of each iceberg order, the Trading System responds with a new version, 'AD', of the **5E3** 'Acknowledge Order Details' message. This contains the public order code, which refers to the visible peak, and a hidden order code that refers to the remaining portion of the iceberg.

5.2.2 Order deletion

To delete an Iceberg order participants can use the existing versions of the order deletion messages and must specify the hidden order code. The acknowledgement will also be returned using the existing versions of the order deletion acknowledgment messages.

5.2.3 Order modification

Release 6.1 provided participants with the ability to modify persistent orders using a single message rather than deleting and re-submitting the order. This functionality has been extended to include iceberg orders.

A new version of the **5MO** 'Modify Order' message, 'AB', has been created to support order modification of iceberg orders. As with current functionality, if price and/or size is not changed the modification is rejected. Order size modification it is applied to the total order size, as specified in the relative size change field of the message. It is not possible to specifically modify the peak. However, if the total Iceberg size is modified to below the displayed peak size, it will cause a modification of the peak size and a loss of time priority to other orders at the same price level. In order to modify an iceberg order participants must specify the hidden order code. Where only the hidden size is modified the order will retain time priority over other orders at the same price level.

There is also a new version, 'AB', of the **5M6** 'Acknowledge Modify Order' message which is sent to the participant. Where only the hidden size is modified this message will include the original hidden and public order codes. Where both the hidden and visible volume is modified this message will include the original public order code and new public and hidden order codes. There will also be fields for the remaining peak size, remaining total order size and remaining total size before modification.

5.2.4 Continuous trading

During continuous trading iceberg orders execute against all persistent and aggressive order types apart from exposure orders. Table 6 shows the markets enabled for Iceberg Orders.

Aggressive iceberg order execution is treated in the same way as a limit order against persistent orders. Details of up to the first 15 trades are included in the new version 'AD' of the **5E3** 'Acknowledge Order Details' message. All subsequent executions are sent in individual **5TF** 'Send Trade Information to Counterparties' messages. The peak of a passive iceberg order resides on the book based on price/time priority. However, in order to encourage participants to disclose as much volume as possible, only the hidden volume of the passive order is given price priority. This means that other visible persistent orders at the same price level are given time priority over the hidden volume of the iceberg.

When the peak of a passive iceberg is fully matched it is refreshed with a new peak from the hidden volume, losing time priority until the entire order is fully matched, modified or deleted.

Where multiple iceberg orders are present on the book at the same price level execution cycles through each initial and interim peak in time priority until either the aggressive order or all of the iceberg orders at that price level are fully matched. Execution does not pass through this price level until all iceberg orders are fully matched.

This provides a significant advantage over participants using a "tranching" facility who could potentially miss out on executions in the time taken to submit a new "order tranche". This is illustrated in the diagrams below. Scenario 1 shows the results of using order tranching, whilst scenario 2 shows the outcome if iceberg orders are used.

Scenario 1 - Order Tranching

Before execution of aggressive buy order for 30,000:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
50,000	99	100	10,000
25,500	98	100	10,000
		103	10,000
		105	20,000



Tranche Orders waiting	Price (p)	Volume
LO	100	10,000
LO	100	10,000
LO	100	10,000
LO	100	10,000

After execution of aggressive buy order:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
50,000	99	100	10,000
25,500	98	105	20,000



Tranche Orders waiting	Price (p)	Volume
LO	100	10,000
LO	100	10,000
LO	100	10,000

Scenario 2 - Iceberg Order

Before execution of aggressive buy order for 30,000:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
50,000	99	100	10,000
25,500	98	100	10,000
		103	10,000
		105	20,000



Total Remaining Volume	Peak Refresh Size	Volume displayed on Book	Price
50,000	10,000	10,000	100

After execution of aggressive buy order:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
50,000	99	100	10,000
25,500	98	103	10,000
		105	20,000



Total Remaining Volume	Peak Refresh Size	Volume displayed on Book	Price
30,000	10,000	10,000	100

Where partial execution of a peak occurs the remainder of that peak is visible on the book. It will only be refreshed when a subsequent execution takes the remaining peak size. If the remaining peak is subsequently matched as well as a portion from the next "hidden peak", the remainder of this portion will then become the visible peak and will be given a new price/time priority. This is shown in the diagram below.

Scenario 3 – Iceberg Order Partial Execution

Before execution of aggressive sell order for 11,500:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
10,000	100	101	20,000
50,000	99		
25,500	98		



Total Remaining Volume	Peak Refresh Size	Volume displayed on Book	Price
30,000	10,000	10,000	100

After execution of aggressive sell order:

BUY		SELL	
Volume	Price (p)	Price (p)	Volume
8,500	100	101	20,000
50,000	99		
25,500	98		



Total Remaining Volume	Peak Refresh Size	Volume displayed on Book	Price
18,500	10,000	8,500	100

Passive executions will generate a new unsolicited message type – The **5TG** 'Send Iceberg Trade Information to Counterparties' message. This message can contain up to 40 executions and includes details of the original public order code, the new public order code for each executed peak, and the hidden order code. The **5TG** will also include the remaining peak size, remaining total size, the total size of the visible that has executed and where appropriate the total hidden size that has executed. All relevant trade codes will be included in this message.

5.2.5 Auction calls

The total volume of an Iceberg order will participate in auctions and contribute to the uncrossing price, alongside other persistent order types, with only the peak visible.

During uncrossing all orders are treated as aggressor for charging purposes. However for uncrossing purposes the trading system determines whether the buy or sell side orders will act as aggressors.

This is based on whether there is a buy or sell side surplus. A surplus of buy side orders will mean that the sell side iceberg orders are treated as aggressors and vice versa.

Aggressive iceberg executions will result in **5TF** 'Send Trade Information to Counterparties' messages being generated. Passive iceberg executions will generate the **5TG** 'Send Iceberg Trade Information to Counterparties' messages. The **5TG** also contains a trade type indicator field, which shows whether iceberg executions were generated during an auction 'UT' or continuous trading 'AT'.

5.2.6 Own order book download

During an Own Order Book Download, the **5OF** 'First Order Download Response' and **5S1** 'Subsequent Order Download Response' messages will include any iceberg orders residing on the order book. However, these messages will differ from the standard **500** 'Order Details' messages in that the market mechanism type will be 'IB', the order code will be the hidden order code with the volume being the remaining total size.

As a consequence, should a participant lose their trading data, they will be unable to reconstruct their private order book, as no information about their visible orders will be available until an Iceberg Order is executed against. The hidden order code can be used to delete this order if required.

5.2.7 Advisory codes

Depending on the situation, rejected iceberg orders will either generate an existing advisory code or one of the new codes listed in the table below:

Table 5 – Iceberg Specific Advisory Codes

Code	Description
Q457I	'Peak size cannot be more than total size'
Q458I	'Iceberg orders not allowed in segment'

5.2.8 LMIL Broadcast Data

There are no changes to the structure of LMIL messages as a result of the implementation of Iceberg orders.

Iceberg orders will be disseminated using the standard **500** 'Order Details' message, with the size set to the remaining peak size. This message will contain the public order code associated with the iceberg, and will be presented as a limit order with market mechanism type of 'LO'. The hidden order code will not be disseminated. The **50E** 'Order Deletion/Expiry/Fully Matched' message will contain the public order code of any iceberg orders that fit this criteria.

The Public Order Book Download service will disseminate all Iceberg Orders with a market mechanism type of 'LO'- Limit Order.

Modification of iceberg order price or remaining peak size generates the standard **50E** 'Order Deletion/Expiry/Fully Matched' message. The **500** 'Order Details' message will also be generated unless modification causes the order to be removed from the order book. Where only the hidden volume is modified no broadcast message will be disseminated.

The **5SF** 'Enhanced Best Price' message will be derived from the peak size of iceberg orders and will not include any hidden volume.

The **5DV** 'Cumulative Number and Volume of Trades' message will include execution of hidden volume, which will increment the number of trades total for each constituent trade.

The total size of an iceberg order will contribute to the uncrossing price and volume disseminated in the **5UD** 'Uncrossing Price and Volume' messages. The total volume for uncrossing cannot be derived via any other method.

During uncrossing all partial execution details (contained in the **500** "Order Details" message) will be suppressed. The **50E** "Order Deletion/Expiry/Fully Matched" message will continue to be published for fully executed orders. If there is any partial execution at the end of uncrossing an Order Details message will be broadcast to update the remaining order size.

Table 6 – Markets enabled for Iceberg Orders

Market	Iceberg Orders Allowed
SETS	Y
ETFS	Y
Covered Warrants	N
SETSmm	Y
SEAQ Crosses*	N
SEATS Plus	N
International Order Book	Y
International Bulletin Board	N

* SEAQ Crosses will be decommissioned post SETSmm go-live

5.3 Customer Development Service enhancements

Following consultation with the market, the Customer Development Service (CDS) will be more closely aligned with the production environment. Historically, CDS re-alignments were focused primarily on the SETSmm market, but will now include all production segments. This provides a more live-like market configuration to better support customers' testing requirements. The CDS will be fully aligned with all live segments and redundant segments and sectors will be removed with effect from 14 July 2003.

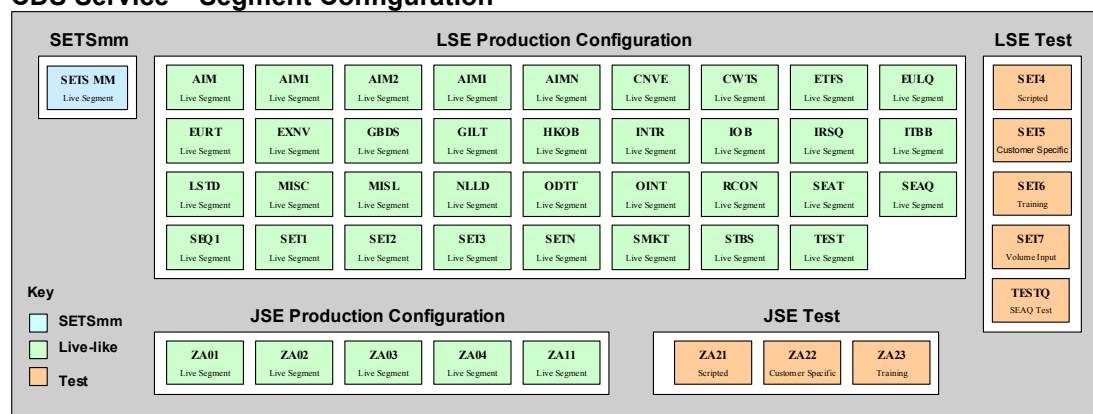
In the period between CDS go-live for SETSmm and SETSmm production go-live itself, CDS will not mirror live service precisely, but will reflect the market segment due to be in place post SETSmm production go-live, after which the CDS service will be aligned on a regular basis with the production environment. The initial SETSmm CDS configuration will contain SEAQ FTSE 250 securities. These securities will be moved from market segment SEAQ - market sectors F250 and SQOS, and market segment SEQ1 - market sectors FS25 and SEQ1.

Updated CDS documentation will be available from 23/6/03 in the Technical Library – Testing Documentation section of our website:

<http://www.londonstockexchange.com/techlib/techdoc.asp>

The enhanced CDS is reflected in the following diagram:

CDS Service – Segment Configuration



6. Testing and project timescales

6.1 Accreditation Policy

The Exchange announced the formal implementation of its Accreditation Policy on 1 May 2003. All Independent Software Vendors (ISVs) and customers who develop in-house software must have passed a full conformance test in order to be accredited.

Accreditation details specifying core software attributes, such as version number, must also be passed to the Exchange. It is the developer's responsibility to keep the Exchange informed of any changes to the core components of the software. This information will then be used to track performance and usage of software in the market. Full details of the Accreditation Policy can be found at:

http://www.londonstockexchange.com/techlib/techdoc_testacc.asp

Customers using accredited software will benefit from a greatly reduced level of mandatory testing.

6.2 SETSmm - Conformance testing

ISVs must pass a High Volume Service (HVS) test to ensure that their systems can cope with the additional bandwidth associated with the new SETSmm broadcast data groups they will support. There is no mandatory testing requirement for In-House Developers and customers using unaccredited software, although an HVS test is recommended. The HVS Technical Guidance Note and Service Announcement (Live 15/03) can be found at:

<http://www.londonstockexchange.com/cmsattach/1790.pdf>

<http://www.londonstockexchange.com/techlib/word/ser/Live1503.doc>

Any software that does not currently support SETSmm trading functionality must also pass a full trading conformance test.

All customers using accredited software are recommended to conduct a HVS test if sum of total additional bandwidth is greater than 99kbps.

6.3 SETSmm CDS

The CDS environment will be updated to include full SETSmm functionality. Dummy participants will provide activity for the SETSmm market to ensure an adequate level of liquidity.

In order to assist ISVs and In-House Developers, access to the CDS environment can be provided prior to passing a HVS test.

Customers using accredited software are recommended to make use of the CDS and testing documentation will be provided to aid this process.

6.4 Iceberg orders - Conformance testing

ISVs, In-House Developers and customers using unaccredited software are required to undertake a full trading conformance test if they wish to implement Iceberg orders.

There is no mandatory testing requirement for customers using accredited software.

6.5 Iceberg orders - CDS

The CDS environment will be updated to support full iceberg order functionality.

In order to assist ISVs and In-House Developers, access to the CDS environment can be provided prior to passing conformance testing.

Customers using accredited software are recommended to test on this environment and testing documentation will be provided to aid this process.

Table 7 below summarises the customer testing requirements.

Table 7 – Customer Testing Requirements

	Icebergs		SETSmm	
	Trading	LMIL	Trading	LMIL
ISVs	Mandatory Conformance	n/a	Recommend CDS	Mandatory HVS
In-House or Unaccredited Software Customers	Mandatory Conformance	n/a	Recommend CDS	Recommend HVS
Accredited Software Customers	Recommend CDS	n/a	Recommend CDS	Recommend HVS *
Mandatory LCON	No	No	No	Yes

** HVS is only recommended for Accredited Software Customers if sum of total additional bandwidth is greater than 99kbps.*

6.6 Participant test weekend (PTW)

A PTW will be made available on 18 October 2003 and can be booked by participants to test the SETSmm and iceberg order functionality on the live environment. The PTW allows participants to conduct unscripted testing between 10am and 4pm. Testing can be booked on 020 7797 3100 – Option 2.

6.7 Further support

The Client Technology Group will provide technical support during the implementation of these enhancements via the following points of contact:

- The Technical Information Desk - Tel: 020 7797 3939, STX 33939
- E-mail Client Technology Group at ctg@londonstockexchange.com
- Technical queries may also be raised directly through your Technical Account Manager

Appendix A - Message types

Enter Order

Message Type: '5EO'

Message Version Identifier: 'AD'

Direction: Participant to Exchange

Description: This message is used by a participant to enter the various order types supported by the trading system.

Architecture Header

Field Name	Offset	Length	Format	Contents
Message Reference Number	8	10	A	Unique reference assigned by participant
User Code	18	6	A	Assigned by participant
Authentication Code	24	4	A	Specified by participant
Interchange Type	28	1	A	'I'
Re-transmission Indicator	29	1	A	N/A
Session Error Code	30	5	A	N/A
Reserved Field	35	11	A	Reserved
Reserved Field	46	2	A	Reserved
Total Length	48 bytes			

Business Header

Field Name	Offset	Length	Format	Contents
Service Code	48	3	A	Specified by participant
Market Segment Code	51	4	A	Specified by participant
Participant Code	55	11	A	Specified by participant
Message Type	66	3	A	'5EO'
Message Version Identifier	69	2	A	'AD'
Date of Message Preparation	71	8	N	Current date
Time of Message Preparation	79	6	N	Current time
Participant Message Sequence Number	85	4	N	N/A
Reserved Field	89	11	A	Reserved
Reserved Field	100	2	A	Reserved
Total Length	102 bytes			

Message Text

Field Name	Offset	Length	Format	Contents
Market Mechanism Type*	102	2	A	'AB', 'LO', 'CP', 'FE', 'IE', 'HO', 'MO', 'PI', 'AA' or 'IB'
Tradable Instrument Code*	104	12	A	Specified by participant
Country of Register*	116	2	A	Specified by participant
Currency Code*	118	3	A	Specified by participant
Participant Order Reference	121	10	A	Optional parameter
Dealing Capacity*	131	1	A	'A', 'B', 'C', 'P', 'Q', 'R', 'S', 'T' or 'U'
Buy/Sell Indicator*	132	1	A	'B' or 'S'
Client Reference**	133	15	A	Assigned by Participant
Order Size*, ***	148	12	N	Specified by Participant
Order Peak Size****	160	12	N	Specified by Participant
Order Price	172	18	N	Specified by participant
Hit Order Code	190	10	A	Specified by participant
Personal Exposure	200	9	A	Optional Information parameter
Time Validity	209	4	N	Specified by participant
Date Validity	213	8	N	Specified by participant
Single Fill Indicator*****	221	1	A	'Y' or 'N'
Preferred Counterparty*****	222	11	A	Specified by Participant
Total Length	233 bytes			

* Mandatory field

** Mandatory field where the Dealing Capacity is 'A'

*** Total Order Size for Iceberg Orders

**** Can only be specified with Iceberg Orders

***** Must be 'N' for all orders except for Firm & Indicative Exposure Orders and Hit Orders; for Hit Orders must be spaces

***** Must not be specified for Iceberg Orders

Acknowledge Enter Order

Message Type: '5E3'

Message Version Identifier: 'AD'

Direction: Exchange to participant.

Description: This message is sent by the Exchange to acknowledge receipt of the Enter Order message and inform the participant of the order code(s) which have been assigned.

Architecture Header

Field Name	Offset	Length	Format	Contents
Message Reference Number	8	10	A	From Enter Order Message for Interchange Type 'I' assigned by Exchange for Interchange Type 'U'
User Code	18	6	A	From Enter Order Message for Interchange Type 'I' assigned by Exchange for Interchange Type 'U'
Authentication Code	24	4	A	Specified by Exchange
Interchange Type	28	1	A	'I' or 'U'
Re-transmission Indicator	29	1	A	Reserved
Session Error Code	30	5	A	N/A
Reserved Field	35	11	A	Reserved
Reserved Field	46	2	A	Reserved
Total Length	48 bytes			

Business Header

Field Name	Offset	Length	Format	Contents
Service Code	48	3	A	From Enter Order Message
Market Segment Code	51	4	A	From Enter Order Message
Participant Code	55	11	A	From Enter Order Message
Message Type	66	3	A	'5E3'
Message Version Identifier	69	2	A	'AD'
Date of Message Preparation	71	8	N	Current date
Time of Message Preparation	79	6	N	Current time
Participant Message Sequence Number	85	4	N	N/A
Reserved Field	89	11	A	Reserved
Reserved Field	100	2	A	Reserved
Total Length	102 bytes			

Message Text

Field Name	Offset	Length	Format	Contents
Order Code**	102	10	A	Assigned by Exchange
Participant Order Reference	112	10	A	From Enter Order Message
Remaining Order Size***	122	12	N	From Order on Order Book
Tradable Instrument Code*	134	12	A	From Enter Order Message
Country of Register*	146	2	A	From Enter Order Message
Currency Code*	148	3	A	From Enter Order Message
Number of Trades in Message	151	2	N	Specified by Exchange
Number of Related Trade Messages	153	4	N	Specified by Exchange
Public Order Code***	157	10	A	Specified by Exchange
Application Advisory Code	167	5	A	N/A or Advisory Code
Trade Message String	172	**	A	**
Total Length	1327 bytes maximum, 172 bytes minimum			

- * Mandatory field
- + For Iceberg Orders, this is Hidden Order Code
- ++ For Iceberg Orders, this is Remaining Total Size
- +++ For Iceberg Orders, this is Public Order Code
- ** This is a variable length field, which can contain up to 15 trade messages sent in the reply. The format of the Trade message string is detailed below.

The Trade Message String consists of iterations of the following message where the Interchange Type is 'I' and not 'U':

Field Name	Offset	Length	Format
Trade Code	0	10	A
Participant Code Buy*	10	11	A
Participant Code Sell*	21	11	A
Trade Size	32	13	S
Trade Price	45	18	N
Trade Date	63	8	N
Trade Time	71	6	N
Total Length	77 bytes		

Note: the maximum trades in the Trade String for both the **5E3** and **5M6** messages (currently 15) may need to be decreased to accommodate the additional Iceberg Order fields.

Message Type: '5TG'

Message Version: 'AA'

Direction: Exchange to participant.

Description: This message is sent by the Exchange to the owner of an iceberg order residing on the Quote/Order Book that has been partially or fully matched.

Architecture Header

Field Name	Offset	Length	Format	Contents
Message Reference Number	8	10	A	Unique reference assigned by Exchange
User Code	18	6	A	Assigned by Exchange
Authentication Code	24	4	A	Specified by Exchange
Interchange Type	28	1	A	'U'
Re-transmission Indicator	29	1	A	Reserved
Session Error Code	30	5	A	N/A
Reserved Field	35	11	A	Reserved
Reserved Field	46	2	A	Reserved
Total Length	48 bytes			

Business Header

Field Name	Offset	Length	Format	Contents
Service Code	48	3	A	From order on Order book
Market Segment Code	51	4	A	From order on Order Book
Participant Code	55	11	A	From order on Order Book
	66	3	A	'5TG'
Message Version Identifier	69	2	A	'AA'
Date of Message Preparation	71	8	N	Current date
Time of Message Preparation	79	6	N	Current time
Participant Message Sequence Number	85	4	N	N/A
Reserved Field	89	11	A	Reserved
Reserved Field	100	2	A	Reserved
Total Length	102 bytes			

Message Text

Field Name	Offset	Length	Format	Contents
Tradable Instrument Code*	102	12	A	From Order on Book
Country of Register*	114	2	A	From Order on Order Book
Currency Code*	116	3	A	From Order on Order Book
Order Code (Buy)**	119	10	A	From Order on Order Book
Order Code (Sell)**	129	10	A	From Order on Order Book
Public Order Code (Buy)***	139	10	A	From Order on Order Book
Public Order Code (Sell)***	149	10	A	From Order on Order Book
Participant Code (Buy)****	159	11	A	From Order on Order Book
Participant Code (Sell)****	170	11	A	From Order on Order Book
Trade Price*	181	18	N	From Order on Order Book
Participant Order Reference (Buy)*****	199	10	A	From Order on Order Book
Participant Order Reference (Sell)*****	209	10	A	From Order on Order Book
Trade Date*	219	8	N	Specified by Exchange
Trade Time*	227	6	N	Specified by Exchange
Trade Type Indicator	233	2	A	Specified by Exchange
Remaining Total Order Size*	235	12	N	From Order on Order Book
Remaining Peak Order Size*	247	12	N	From Order on Order Book
New Public Order Code	259	10	A	Specified by Exchange
Total Visible Trade Size	269	12	N	Specified by Exchange
Total Hidden Trade Size	281	12	N	Specified by Exchange
Peak Refresh Size	293	12	N	From Order on Order Book
Peak Trade Code	305	10	N	Specified by Exchange
Number of Trades in String	315	2	N	Specified by Exchange
First Trade in this Message	317	4	N	Specified by Exchange
Last Trade in this Message	321	4	N	Specified by Exchange
Total Number of Trades	325	4	N	Specified by Exchange
Trade Code Message String*****	329	*****	N	
Total Length	729 bytes maximum, 339 bytes minimum			

* Mandatory field

** Note that either Order Code (Sell) or Order Code (Buy) is specified

*** Note that either Public Order Code (Sell) or Public Order Code (Buy) is specified

**** Note that the participant codes will reflect central counterparty functionality

***** Note that either Participant Order Reference (Sell) or Participant Order Reference (Sell) is specified

***** This is a variable length field, which can contain up to 40 trade codes sent in the reply. The format of the Trade Code Message String is shown below.

The Trade Message String consists of iterations of the following message:

Field Name	Offset	Length	Format
Trade Code	0	10	A
Total Length	10 bytes		

Message Type: '5MO'

Message Version Identifier: 'AB'

Direction: Participant to Exchange.

Description: This message is sent by a participant to modify the size and/or price of an existing order on the order book.

Architecture Header

Field Name	Offset	Length	Format	Contents
Message Reference Number	8	10	A	Unique reference assigned by participant
User Code	18	6	A	Assigned by participant
Authentication Code	24	4	A	Specified by participant
Interchange Type	28	1	A	'I'
Re-transmission Indicator	29	1	A	N/A
Session Error Code	30	5	A	N/A
Reserved Field	35	11	A	Reserved
Reserved Field	46	2	A	Reserved
Total Length	48 bytes			

Business Header

Field Name	Offset	Length	Format	Contents
Service Code	48	3	A	Specified by participant
Market Segment Code	51	4	A	Specified by participant
Participant Code	55	11	A	Specified by participant
Message Type	66	3	A	'5MO'
Message Version Identifier	69	2	A	'AB'
Date of Message Preparation	71	8	N	Current date
Time of Message Preparation	79	6	N	Current time
Participant Message Sequence Number	85	4	N	N/A
Reserved Field	89	11	A	Reserved
Reserved Field	100	2	A	Reserved
Total Length	102 bytes			

Message Text

Field Name	Offset	Length	Format	Contents
Order Code**	102	10	A	Specified by participant
Tradable Instrument Code*	112	12	A	Specified by participant
Country of Register*	124	2	A	Specified by participant
Currency Code*	126	3	A	Specified by participant
Participant Order Reference**	129	10	A	Optional parameter
Buy/Sell Indicator*	139	1	A	Specified by participant
Price*	140	18	N	Specified by participant
Relative Size Change*	158	13	S	Specified by participant
Time Validity**	171	4	N	Specified by participant
Date Validity**	175	8	N	Specified by participant
Total Length	183 bytes			

* Mandatory field

+ The Hidden Order Code must be specified for Iceberg Orders

** These fields cannot be modified if the order is an Iceberg Order, and so must be blank

Message Type: '5M6'

Message Version Identifier: 'AB'

Direction: Exchange to participant.

Description: This message is sent by the Exchange to acknowledge receipt of the Modify Order message and inform the participant of any resulting changes made to the order.

Architecture Header

Field Name	Offset	Length	Format	Contents
Message Reference Number	8	10	A	From Modify Order Message
User Code	18	6	A	From Modify Order Message
Authentication Code	24	4	A	Specified by Exchange
Interchange Type	28	1	A	'I'
Re-transmission Indicator	29	1	A	Reserved
Session Error Code	30	5	A	N/A
Reserved Field	35	11	A	Reserved
Reserved Field	46	2	A	Reserved
Total Length	48 bytes			

Business Header

Field Name	Offset	Length	Format	Contents
Service Code	48	3	A	From Modify Order Message
Market Segment Code	51	4	A	From Modify Order Message
Participant Code	55	11	A	From Modify Order Message
Message Type	66	3	A	'5M6'
Message Version Identifier	69	2	A	'AB'
Date of Message Preparation	71	8	N	Current date
Time of Message Preparation	79	6	N	Current time
Participant Message Sequence Number	85	4	N	N/A
Reserved Field	89	11	A	Reserved
Reserved Field	100	2	A	Reserved
Total Length	102 bytes			

Message Text

Field Name	Offset	Length	Format	Contents
Order Code ⁺	102	10	A	Assigned by Exchange
Original Order Code [*]	112	10	A	From Modify Order Message
Public Order Code⁺⁺	122	10	A	Assigned by Exchange
Original Public Order Code	132	10	A	From Order on Order Book
Participant Order Reference	142	10	A	From Modify Order Message
Original Participant Order Reference	152	10	A	From Order on Order Book
Aggregate Size ⁺⁺⁺	162	12	N	From Modified Order on Order Book
Aggregate Size Before Modification [*]	174	12	N	From Original Order on Order Book
Remaining Total Size[*]	186	12	N	From Modified Order on Order Book
Remaining Total Size Before Modification[*]	198	12	N	From Original Order on Order Book
Tradable Instrument Code [*]	210	12	A	From Modify Order Message
Country of Register [*]	222	2	A	From Modify Order Message
Currency Code [*]	224	3	A	From Modify Order Message
Number of Trades in Message	227	2	N	Specified by Exchange
Number of Related Trade Messages	229	4	N	Specified by Exchange
Application Advisory Code	233	5	A	N/A or Advisory Code
Trade Message String	238	**	A	**
Total Length	1393 bytes maximum, 238 bytes minimum			

* Mandatory field

⁺ For Iceberg Orders, this is iceberg order code

⁺⁺ For Iceberg Orders, this is Public limit order code

⁺⁺⁺ For Iceberg Orders, this is remaining peak size

^{**} This is a variable length field, which can contain up to 15 trade messages sent in the reply. The format of the Trade Message String is as per the Acknowledge Order Details (**5E3**) message.

Note: the maximum trades in the Trade String for both the **5E3** and **5M6** messages (currently 15) may need to be decreased to accommodate the additional **5M6** fields.

Appendix B - SETSmm default period schedules

Default Period Schedule for market sectors 4SMM, 5SMM, 250F, 250T, 250S

Start Time	Period Name	Period Description
07.00	OPEN	Market Open
07.50	PMMP	Opening Auction
08.00	MP10	Continuous Trading 10% Price Monitoring threshold
16.20	MPV1	VWAP Period
16.25	MPV2	VWAP Period
16.30	CCAL	Closing Auction
16.35	CAUC	Order Management Period
17.00	OBC	Order Book Close
17.15	CLOS	Close

Default Period Schedule for market sectors SMM1, SMM2, F25F, F25T, F25S, F25E

Start Time	Period Name	Period Description
07.00	OPEN	Market Open
07.50	PMMP	Opening Auction
08.00	MP15	Continuous Trading 15% Price Monitoring threshold
16.20	MPA1	VWAP Period
16.25	MPA2	VWAP Period
16.30	CCAL	Closing Auction
16.35	CAUC	Order Management Period
17.00	OBC	Order Book Close
17.15	CLOS	Close

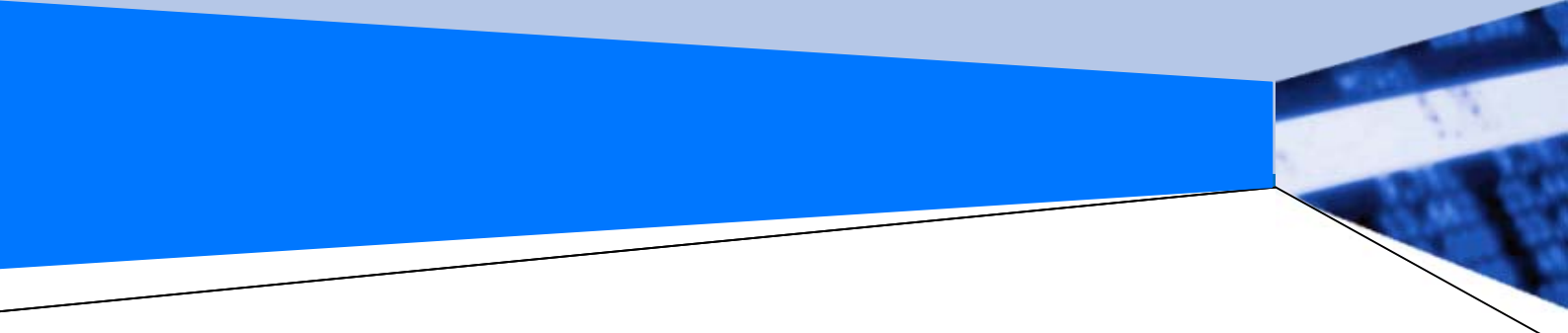
Default Period Schedule for market sectors 25SM, 25FS

Start Time	Period Name	Period Description
07.00	OPEN	Market Open
07.50	PMMP	Opening Auction
08.00	MP25	Continuous Trading 25% Price Monitoring threshold
16.20	MPW1	VWAP Period
16.25	MPW2	VWAP Period
16.30	CCAL	Closing Auction
16.35	CAUC	Order Management Period
17.00	OBC	Order Book Close
17.15	CLOS	Close

Appendix C - SETSmm temporary period schedules

Default Period Schedule for market sectors 4SMM, 5SMM, 250F, 250T, 250S

Period Name	Period Description
AS15	Auto Execution Suspension 15
MM15	SETSmm Trading 15
MM25	SETSmm Trading 25
MMD2	Mandatory Market Maker Period 2
MMM2	Mandatory Market Maker Period 2
MMP1	Mandatory Market Maker Period 1
MMP2	Mandatory Market Maker Period 2
MMP3	Mandatory Market Maker Period 3
PMM1	Pre-Mandatory Period 1
SMFT	SETSmm Fast Index Expiry
XO10	Execution only/ No Entry 10
XO15	Execution only/No Entry 15
XO25	Execution only/No Entry 25



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