⦿LME

An HKEX Company

LMEselect v10 Functional Definition

Disclaimer

Table of Contents

Document History

Version	Date	Change Description
1.0	March 2023	Initial release
1.1	15/03/2024	1.2.2 updated to include daily price limits
		1.2.4 opening price
		2.1.3 handling for a triggered restated Stop
		2.1.3.1 Stop triggering examples updated
		2.2.4 cancellation of a tradable instrument
		2.2.13 Example 4 clarification
		2.3.1.1 updated examples
		2.3.4.1 description and 2.3.4.2 examples
		2.3.8.2 examples added
		3.2.1 NCM utilisation included in GCM3.2.2 text removed
		4.4 most stringent limits
		4.5 merged order book validation
1.2	29/10/2024	1.4 Technical Halt
		2.1.3 Example 2 correction
		2.1.7.1 expiry conditions
		2.3.2 correction
		2.3.3 correction
		2.3.6.1.2 example
		3.2.6 correction

Glossary

Acronym/Term	Description
Average	Exchange defined futures strategy type
3M	Rolling three month prompt
Butterfly	Custom strategy type
Call Spread	Exchange defined options strategy type
Carry	Exchange defined futures strategy type
Carry Average	Exchange defined futures strategy type
Cash	Prompt date which is two business/settlement days from the current trading day
Condor	Custom strategy type
Delta Hedge	Custom strategy type
Drop Copy	Near real-time Execution Report message interface
FOK	Fill or Kill
GCM	General Clearing Member
Gross Long	Limit type
Gross Short	Limit type
GTD	Good Till Day
GTC	Good Till Cancelled
Iceberg	Order type
IOC	Immediate or Cancel
IOMP	Indicative Opening Mid Price
IOP	Indicative Opening Price
LFC	Live Forward Curve
Limit	Order type

Acronym/Term	Description
LMEsource	Market Data service
LME Pricing service	Real-time pricing system
Market	Order type
Market Maker	Liquidity provider
MMP	Market Maker Protection
Net Long	Limit type
Net Short	Limit type
NCM	Non Clearing Member
Order Cancel Request	Order cancellation message
One Cancels Other (OCO)	Order type
OFV	Option Fair Value
Order Entry Gateway	Order routing interface
Per Order Notional Value	Limit type
Per Order Quantity	Limit type
Post Only	Order type
Prompt date	Delivery date of a futures contract/instrument
PTRM	Pre Trade Risk Management
RFQ	Request for Quote
Risk Management Gateway	Risk management interface
Rolling (instrument)	Relative to the current trading day, see also 3M, Cash and Tom-Next
Security Definition Request	Tradable instrument creation message
SEP	Self Execution Prevention
Single (instrument)	Calendar dated prompt date
Stop Limit	Order type

Acronym/Term	Description
Stop Market	Order type
Stop	Order type can be either Stop Limit or Stop Market
Straddle	Custom strategy type
Strangle	Custom strategy type
TAPO	Traded Average Price Option
TAR	Trade at Reference, eg, TAS
TAS	Trade at Settlement
Tom	Tomorrow. Rolling prompt for the next business day
Tom-Next	Tomorrow to the next LME business day
Tradable Instrument	Tradable instrument against which orders can be managed and trades executed. A trade in a single tradable instrument can generate positions in multiple instruments eg, a trade in a Carry tradable instrument creates positions in two instruments
Trading State	Current trading state message

A more general glossary can be found at: https://www.lme.com/-/media/Files/Education/Online-resources/Brochures/The-LME-from-A-to-Z.pdf

Preface

This document provides a detailed description of the business functionality that will be available in the LME's new electronic trading platform, LMEselect v10, which will replace the existing platform, LMEselect v9.4.

The document is written in the present tense and designed to be read as if LMEselect v10 is live.

The document is organised into the following sections:

- Trading Day
- Trading Functionality includes Order Types, Order Management and Order Matching.
- Risk Management includes Market Maker Protection Configuration and Pre Trade Risk Management
- Pricing.

The examples provided are generic and any dates specified are for illustrative purposes only.

Target Audience

The document is aimed at those wishing to gain a greater understanding of the functionality provided by LMEselect v10. It is intended as a description of the functionality and does not detail the LME market model. It should therefore be read in conjunction with related materials on LME.com for LMEselect v10 and LMEsource v4.

Delivery Phasing

This document covers all the functionality available in LMEselect v10 however functionality will be delivered in phased releases.

Functionality that will be included in a later release is specified in the following table and shown throughout the document in *dark grey italics*. The initial release will contain all functionality except that specified in the table below:

Function	Reference
Market orders	2.1.2 Market
	2.1.4 Iceberg
	2.1.7.2 Order Types and Permitted Order Validity Conditions
	2.3.8 Order Execution Processing
	3.2.5.2 Order Handling
	Appendix B: PTRM Utilisation Calculation Examples
Stop Market orders	2.1.3 Stop
	2.1.3.1 Stop Order Triggering (Examples)
	3.2.5.2 Order Handling
One Cancels Other orders	2.1.1 Limit
	2.1.5 One Cancels Other (OCO)

Function	Reference
Iceberg	
Post Only orders	
Fill or Kill	
Mass Quotes	

Function	Reference
	1.3.1 Trading Pause
	1.3.2 Trading Halt
	2.1.1 Limit
	2.2.1 Submission
	2.2.4 Cancellation
	2.2.5 Order Identification
	2.2.8 Mass Quotes
	2.2.9 Market Maker Protection (MMP)
	2.2.11 Inbound Message Throttle
	2.2.12 Speed Bumps
	2.3.9 Self-Execution Prevention (SEP)
	2.3.9.1 SEP Processing
	3.2.5.2 Order Handling
Market Maker Protection	1.2.3 Pre-Open
	2.2.9 Market Maker Protection (MMP)
	2.2.9.1 Reset Market Maker Protection
	2.2.11 Inbound Message Throttle
	2.3.8 Order Execution Processing
	3.1 Market Maker Protection Configuration
Request for Quote	1.2.4 Open
	1.2.5 Post Trade
	2.2.10 Request for Quote (RFQ)
	2.2.11 Inbound Message Throttle
	3.2.5.2 Order Handling
Speed Bumps	2.2.1 Submission
	2.2.12 Speed Bumps
Average strategies	2.3.5.2.1 Futures Strategies
	2.3.6.2 Averages
	3.2.4 Utilisation Pools
	3.2.5.1.1 PTRM Multiplier
	3.2.5.3 Strategy Handling

Function	Reference
Carry Average	
Call Spread / Put Spread	
Custom strategies	
Delta Hedge Strategy	
Option contracts	

Function	Reference
	2.2.8 Mass Quotes (Example)
	2.2.9 Market Maker Protection (MMP)
	2.3.2 Indicative Opening Price (IOP)
	2.3.4.1 Sequence of Uncrossing
	2.3.5.2.2 Options Strategies
	2.3.5.3 Custom Strategies
	2.3.6 Strategy Leg Pricing
	2.3.6.4.1. Examples (Strategy Leg Pricing)
	3.2.3.3. Gross Long Quantity (Example)
	3.2.3.6 Net Long Quantity (Example)
	3.2.4 Utilisation Pools
	3.2.5.1 Contract Handling
	4.3 Reference Price
	4.4 Price Bands
	4.5.3 Price Bands for Options
	Appendix A: Product Hierarchy
	Appendix B: PTRM Utilisation Calculation Examples
Self Execution Prevention	2.3.8 Order Execution Processing
	2.3.9 Self-Execution Prevention (SEP)
	2.3.9.1 SEP Processing

1   Trading Day

The trading day is comprised of market states which control the functions that are available to participants. Market states are sequenced to occur in a particular order which is governed by the trading schedule.

The trading times that are published by the LME for LMEselect v10 specify when the market is open and all trading functionality is available.

During the trading day, LMEsource publishes market state and trading state changes as they occur.

The following diagram shows market states in the trading schedule for a typical business day:
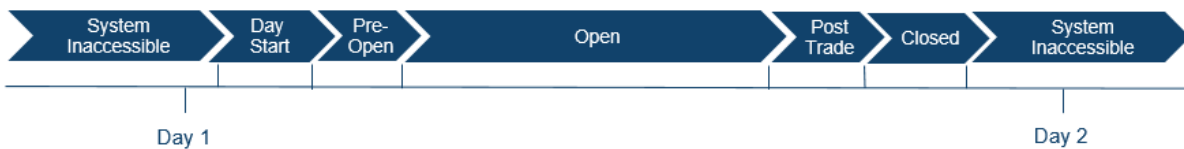
The functionality available in a market state can be overridden when a state condition such as pause or halt is imposed.

1.1   Trading Schedule

From time to time it may be necessary for the LME to change the schedule applied to a market, product or contract.

There may be a number of circumstances when a change to the trading schedule is required, for example:

- To adjust the trading schedule of a specific tradable instrument
- Extend trading in a contract beyond its normal trading time
- Close early on a specific day eg, Christmas Eve.

Any change in the trading schedule will be communicated to members.

1.2   Market States

The trading day is separated into a number of distinct periods, known as market states, which are configured to transition at the times specified in the trading schedule.

Tradable instrument creation in the Order Entry Gateway and functions available in the Risk Management Gateway have no market state dependency but are only constrained by gateway availability.

On creation a tradable instrument will adhere to the existing trading schedule and current market state of the contract.

1.2.1 System Inaccessible

LMEselect v10 enters this state at the end of the trading day and remains in this state until the start of the next trading day. When LMEselect v10 becomes inaccessible all users are logged off and no gateway connectivity (including ping or telnet) is permitted.

Before the start of the trading day, Good Till Cancelled (GTC) and Good Till Date (GTD) orders that have been persisted from the previous trading day are restated following validation against risk limits.

1.2.2 Day Start

External gateways (Order Entry, Drop Copy and Risk Management) are available to accept connection requests from client applications.

The list of tradable instruments and associated daily price limits will be published by LMEsource in advance of pre-open.

1.2.3 Pre-Open

All order types *with the exception of Post Only orders* can be submitted, see Order Types. *Mass quotes are also available.*

Day, GTD and GTC order qualifiers are accepted however orders with IOC and *FOK* validity conditions will be rejected as no matching can take place.

Order management can be performed on orders submitted and restated persisted orders. No order matching is performed, this only occurs during open.

Throughout pre-open either an Indicative Opening Price (IOP) or an Indicative Opening Mid Price (IOMP) is calculated whenever there is an update to the price resulting from incoming orders, see Indicative Opening Price. If there are no orders or orders on only one side then no indicative prices are generated.

Market Marker Protection functionality will not be available in pre-open as the protection response can only be invoked when the market is in the open state.

1.2.4 Open

Uncrossing takes place at the beginning of open, see Uncrossing. Once uncrossing has completed resulting in trade execution, an opening price is published by LMEsource. Note, an opening price will only be published once a day.

All configured order types, *mass quotes and Request for Quote (RFQ)* can then be submitted. All order validity conditions are permitted.

Order matching is performed. Implied prices are calculated and published.

1.2.5 Post Trade

New orders are not accepted. Order matching and implied price generation ceases.

Amendment and cancellation is only permitted for persisted orders. *RFQ are not permitted*.

End of day trade statistics are published by LMEsource.

1.2.6 Close

LMEselect v10 will delete all day orders including *mass quotes* and GTC/GTD orders which have reached their expiry conditions Valid GTC and GTD orders are persisted to the next trading day, see Persisted Orders.

1.3 State Conditions

A trading pause or halt can be invoked by the LME during the trading day as a result of a market event or technical disruption.

The trading pause or halt can be applied to the whole market or at any level in the product hierarchy, see [Appendix A]. It can be applied during any market state and can persist across trading days.

The trading schedule will continue to operate but with restrictions of the state condition that has been imposed. LMEsource will publish order book updates in accordance with the underlying market state.

When a state condition is imposed or lifted, market participants will be notified by a status message for the affected contract or tradable instrument and/or a News message.

1.3.1 Trading Pause

When a trading pause is imposed, orders *and quotes* remain in the public order book, no order submission or amendment is permitted but cancellation is allowed if permitted in the underlying market state. Order matching is prevented and no implied prices are generated. Existing implied orders are removed from the order book and only explicit orders remain.

1.3.2 Trading Halt

A trading halt can be imposed without a preceding trading pause.

When a trading halt is imposed, all affected order books including persisted orders *and quotes* are removed. No order entry, amendment or cancellation is permitted and no order matching is performed.

When a trading halt is lifted, the market would normally be placed into pre-open however it can be placed into any state except open. Note that this is an operational control rather than a systematic prevention.

1.4 Technical Halt

In the event of a system component failure, a technical halt will be applied and the Market Data service will publish the Trading State = Technical Halt. On receipt of this message, market participants are required to clear their public and private order books of all orders including persisted orders. Order cancellations will not be transmitted by the gateway.

When a technical halt is applied, all affected order books including persisted orders *and quotes* are removed. No order entry, amendment or cancellation is permitted and no order matching is performed.

2   Trading Functionality

2.1   Order Types

LMEselect v10 supports the following order types which determine how an execution instruction is handled. Every order must have at least one order type and have a validity condition which dictates how long the order remains in the order book. An order with a validity condition beyond the current trading day will be persisted.

2.1.1   Limit

A Limit order is submitted with a price and quantity and will trade at the limit price or better for as much of its stated volume as is available in the order book.

If the order does not fully execute, any residual quantity rests in the order book.

Iceberg, Stop, *One Cancels Other and Post Only* orders are treated as limit types by virtue of a price being specified.

Orders from mass quotes remain active in the order book as limit orders.

2.1.2   Market

A Market order is submitted with a quantity specified but no price. The order is converted to a Limit order at the most stringent upper price band/limit for a bid or lower price band/limit for an offer, see Price Bands/Limits. *The order will trade at the best available price(s) up to its assigned limit price for as much of the stated volume. Any order quantity which is not fully executed rests in the order book as a Limit order at the assigned Limit price based on the most stringent price band/limit. Note, participants should be aware that exchange set price bands can vary in width to adapt to high volatility/fast markets.*

Strategies use a net price which is calculated using the strategy leg price algorithm, see Strategy Leg Pricing. *Market orders in a strategy order book are assigned the strategy net price which is calculated based upon the strategy price bands upper and lower limits, see* Price Bands for Strategies.

A Stop order can be submitted as a Market order which is converted to a Market order when it is triggered, see Stop.

Example 1: Market outright price

Assume dynamic and static price bands are within daily price limits as follows:

Dynamic upper price band limit	Static upper price band limit	Dynamic lower price band limit	Static lower price band limit
1915	*1935*	*1890*	*1895*

An incoming Market bid would be assigned the dynamic upper price band 1915 and an incoming Market offer would be assigned the higher of the dynamic and static price band lower limit which is the static at 1895.

Example 2: Market strategy price

For a M1-3M Carry where the 3M leg is the back leg, the front leg's dynamic price bands are used to determine the assigned price against the 3M Live Forward Curve (LFC) reference price.

Assume the following reference prices and price bands:

Order book	LFC price	Dynamic upper price band limit	Dynamic lower price band limit
M1	6109	6119	6104
3M	6115	6134	6119

The offer price is calculated as follows:

M1 (front leg) lower price band - 3M (back leg) assigned price
6104 – 6115 = -11

The bid price is calculated as follows:

M1 (front leg) upper price band – 3M (back leg) assigned price
6119 – 6115 = 4

2.1.3   Stop

A Stop order is submitted but not visible in the order book until it is triggered by an incoming order or trade that has a price greater or equal to the Stop price for a bid or less than or equal to the Stop price for an offer. A Stop order can also be triggered by an implied order, see Implied Trading.

On submission the originator specifies the order type for the triggered order (Limit *or Market*) and the criteria for triggering the stop order. This can be the traded price or either the traded price or best bid/offer. If a stop order can be triggered immediately on entry or on amendment it is rejected. Upon entry a stop order is assigned a priority timestamp for stop order triggering, see Stop Order Triggering. Once the order has been triggered, it is submitted into the order book and receives a new priority timestamp, see Timestamps. A persisted Stop order that has been triggered will become a Limit order when it is restated.

A triggered Stop order submitted into the order book can trade in the market, which in turn could trigger a second (or multiple) Stop(s) should the Stop order trade through depth. This concept is known as Stop order cascading which can result in orders trading down and up through market price ranges.

2.1.3.1   Stop Order Triggering

The following examples illustrate the rules that determine the sequence in which stop orders are processed where multiple stop orders are triggered by a single action:

- If multiple Stop bids are triggered then the Stop orders are entered into the public book from the lowest Stop price level first.
- If multiple Stop offers are triggered then the Stop orders are entered into the public order book from the highest Stop price level first.
- If there are multiple stop orders within a Stop price level these are entered according to their time priority (ie, oldest first) irrespective of the order type of the triggered order.
- If there are both bid and offer Stop orders triggered by a single event the Stop orders are entered into the public order book in pure round robin basis (ie, alternately processing a Stop order from each side of market).
- If the trigger event is a rising price direction the round robin commences with the bids.
- If the trigger event is a falling price direction the round robin commences with the offers.

Price direction is determined by comparing the triggering event to the last trade price, for example if the triggering event (new best bid, new best offer or trade) is above the last trade price it is rising price. If there is no last trade price (for example where Stop orders can be triggered during uncrossing but there has been no trade) the following rules are applied:

- If both best bid and best offer are above Live Forward Curve (LFC) then it is a rising price.
- If both best bid and best offer are below LFC then it is a falling price.
- If best bid and best offer are equally either side of LFC then assume rising price, for example the LFC is 5700, best bid is 5699 and offer is 5701.
- If best bid and best offer are either side of the LFC with the best bid closer to the LFC it is a rising price, for example the LFC is 5700, best bid is 5699 and offer is 5702.
- If best bid and best offer are either side of the LFC with the best offer closer to the LFC is it a falling price, for example the LFC is 5700, best bid is 5698 and offer is 5701.

Example 1: Last trade or best bid trigger

The following Stop Limit orders are submitted and rest awaiting activation by a best bid/best offer or last trade:

Order	Bid		Offer	
	Limit price	Stop price	Limit price	Stop price
1			1889 (10)	1890
2			1890 (10)	1890
3			1888 (10)	1889
4	1888 (10)	1888		
5	1889 (10)	1889		
6	1890 (10)	1889		

The following Limit order is submitted which triggers all of the resting bid Stop orders:

Order	Bid	Offer
7	1889 (10)	

The offer Stop orders are not triggered. The bid Stop orders are entered into the public order book according to Stop price (lowest first) and then oldest timestamp (within a Stop price level) as follows:

1. Order 4 limit bid at a price of 1888

2. Order 5 limit bid at a price of 1889

3. Order 6 limit bid at a price of 1890.

Example 2: Last trade trigger only

The following Stop Limit orders are submitted and rest awaiting activation by a last trade:

Order	Bid		Offer	
	Limit price	Stop price	Limit price	Stop price
1			1889 (10)	1890
2			1890 (10)	1890
3			1888 (10)	1889
4	1889 (10)	1889		
5	1889 (10)	1889		
6	1890 (10)	1889		

The following Limit orders are submitted:

Order	Bid	Offer
7	1889 (10)	
8		1889 (10)

Order 8 trades with Order 7 and triggers the Stop orders:

- Bids equal to or less than the 1889 trade price – Orders 4, 5 and 6.
- Offers equal to or greater than the 1889 trade price = Orders 1, 2 and 3.

The Stop orders are entered into the public order book according to Stop price (lowest first for bids / highest first for offers) and then time (within a Stop price level), alternating between bids and offers starting with bids as it is a rising price movement as follows:

1. Order 4 limit bid at a price of 1889

2. Order 2 limit offer at a limit price of 1890

3. Order 5 limit bid at a price of 1889

4. Order 1 limit offer at a price of 1889

5. Order 6 limit bid at a price of 1890

6. Order 3 limit offer at a price of 1888.

2.1.3.2 Stop Order Cascading

Multiple Stop orders are triggered and trade through depth

The following Stop Limit orders are submitted and rest awaiting activation by a best bid or last trade:

Order	Bid		Offer	
	Limit price	Stop price	Limit price	Stop price
1	1904 (10)	1900		
2	1907 (10)	1904		
3	1909 (10)	1907		

Limit orders 4 – 7 are submitted and rest in the order book, no Stop orders are triggered.

Order	Bid	Offer
4		1907 (10)
5		1904 (10)
6		1900 (10)
7		1909 (10)
8	1900 (10)	

Order 8 is submitted and trades with Order 6 triggering:

1. Order 1 limit bid which trades with Order 5 at a price of 1904

2. Order 2 limit bid which trades with Order 4 at a price of 1907

3. Order 3 limit bid which trades with Order 7 at a price of 1909.

2.1.4 Iceberg

An Iceberg order is submitted with a visible order quantity that is displayed to the market and a total order quantity. The visible order quantity must be less than the total order quantity and be greater than a minimum ratio of the total order quantity as specified by the LME. For example, if the visible quantity ratio is 0.01, the visible quantity must be at least 1% of the order quantity.

When an order trades with an Iceberg, the visible order quantity must be fully executed before it can be replenished with the next visible order quantity.

For example, an Iceberg order is submitted into the M1 order book as a bid for 1804 with a total order quantity 100 lots and a visible (display) quantity of 10 lots. An incoming offer at 1804 of 15 lots trades the visible quantity of 10 lots at 1804. The visible quantity is replenished from the Iceberg order and fills the remaining 5 lots at 1804. The visible quantity of the Iceberg is reduced to 5 lots and the total remaining hidden quantity is reduced to 85 lots.

The Iceberg will receive a new order priority when the visible order quantity is replenished, see Timestamps. This will also be the case if the order is revised and either the price, total order quantity or visible quantity is increased. An amendment to the visible order quantity will be updated when the visible quantity is next replenished after a fill.

An Iceberg order is not valid for strategy orders or in options contracts and not permitted for Stop or Market orders.

An Iceberg will be subject to a minimum notional value of €10,000 on order entry and amendment which is based on total quantity of the order. For Trade at Settlement (TAS) contracts the calculation uses the current LFC price for the parent instrument added to the TAS differential price. An Iceberg order with a notional value that is less than €10,000 will be rejected.

Example 1: Minimum notional value Iceberg validation

An Iceberg order is submitted into the Aluminium futures M1 order book at 1804 with a total order quantity 6 lots and a visible (display) quantity of 1 lot.

The order value will be multiplied by the Euro/USD exchange rate and if this value is less than 10,000 Euros the order is rejected.

The lot size for the contract is 25.

Assume Euro/USD exchange rate 0.89

Order price x total quantity x lot size x Euro/USD exchange rate

1804 x 6 x 25 x 0.89 = 240,834

This is greater than 10,000 Euros and therefore the order is accepted.

Example 2: Iceberg can be traded out by a single order

An aggressing order can trade the entire order quantity of an Iceberg as shown in the following example:

Order	Bid (total qty) (visible)	Offer
1	6908 (10) (2)	
2	6908 (8) (3)	
3		6908 (14)

Order 3 will trade with the visible quantities of the resting Iceberg orders as follows:

- *Order 1 will trade 2 lots at 6908*
- *Order 2 will trade 3 lots at 6908.*

The remaining quantity of Order 3 will trade out the remaining total order quantity (8 lots) of the oldest Iceberg order (Order 1) at 6908.

The remaining 1 lot will trade against Order 2 at 6908.

Order 2 will remain in the order book at 6908 with a total quantity of 4 lots with 2 lots visible.

2.1.5   One Cancels Other (OCO)

A One Cancels Other is a single order with two order type components, Limit and Stop.

On submission the originator will specify the criteria for triggering the stop order (last traded price or either the last traded price or best bid/offer) and the order type for the triggered Stop (Limit or Market)

A partial trade at the limit price will reduce the quantity available in the OCO. If the order is traded out at the limit price the stop component will be cancelled. Similarly if the Stop is triggered then the Limit component is cancelled.

If the Stop price is triggered the order receives a new priority timestamp and is converted into the order type specified in the triggering instructions either a Limit or Market order.

Example 1: OCO trades at limit price

An OCO is submitted for 10 lots as a limit offer at 6813 with a Stop Limit trigger price of 6808 and a triggered limit price of 6808. The triggering condition for the Stop component is last trade.

An incoming bid for 6813 for 10 lots trades at the OCO limit price and the stop component is automatically cancelled.

Example 2: OCO Stop triggered

An OCO is submitted for 10 lots as a limit offer at 6813 with a Stop Market trigger price of 6808. The triggering condition for the Stop component is last trade or best offer.

An incoming offer at 6808 for 10 lots triggers the Stop component which will either trade (if a matching bid exists) or convert to a Limit order at the most stringent lower price band/limit price and rest in the order book. The original Limit component for 6813 is automatically cancelled.

Example 3: OCO Stop triggered and converted into a Limit order at a new price

An OCO is submitted for 10 lots as a limit offer at 6813 with a Stop Limit trigger price of 6808 and a triggered limit price of 6806. The triggering condition for the Stop component is last trade or best offer.

An incoming offer order at 6808 triggers the Stop order and cancels the Limit component. The triggered Stop is converted to a Limit order at a new price of 6806.

Example 4: OCO partially trades

An OCO is submitted for 15 lots as limit offer at 1825 with a Stop Market trigger price of 1780. The triggering condition for the Stop component is last trade or best offer.

A Limit order for 10 lots is submitted as a bid for 1830. The OCO order trades 10 lots with the incoming order. The OCO remains in the order book with a residual quantity of 5 lots.

2.1.6 Post Only

A Post Only order can only be submitted during market open and must rest in the order book before it can trade. If the order can be executed on entry into the order book it is rejected. If an amendment request would result in the order executing it is rejected and the original order remains.

Example 1: Executable Post Only order

A Post Only order is submitted as a bid for 6491 for 5 lots. An offer at 6491 for 5 lots resting in the order book can match with the incoming Post Only order. The Post Only order is rejected as it can trade.

Example 2: Resting Post Only order

A Post Only Limit is submitted as a bid for 6491 for 5 lots and rests in the order book. An incoming offer at 6491 for 5 lots trades with the resting Post Only order at 6491.

2.1.7 Order Validity Conditions

Order validity conditions added to an order type affect the characteristics of the order.

- Day

  Day order is the default validity condition. The order is only valid on the trading day it was submitted.

- *Fill or Kill (FOK)*

  Fill or Kill orders are only executed if there is sufficient quantity available, at the stated price or better, for them to execute fully. Otherwise the entire order is cancelled.

  FOK orders submitted in pre-open are rejected as they cannot be executed in this market state.

- Immediate or Cancel (IOC)

  Immediate or Cancel orders are executed at the stated price or better for as much order quantity that is available. Any order quantity that cannot be traded is cancelled.

  IOC orders submitted in pre-open are rejected as they cannot be executed in this market state.

  Note: IOC orders are also known as 'Fill and Kill' (FAK).

- Good Till Cancelled

  The order is valid until it is either cancelled or is matched or it is expired, see Persisted Orders.

- Good Till Date

  The order is valid until it is either cancelled or is matched or reaches the specified date or it is expired, see Persisted Orders.

Note: A GTC or GTD order can be entered on any tradable instrument but cannot be rolled or entered into the Tom prompt.

2.1.7.1 Persisted Orders

Good Till Cancelled and Good Till Date orders are persisted at the end of the trading day and restated at the start of the next business day. Orders to be restated are validated against daily price limits, (see Price Bands/Limits) and risk limits, (see Threshold Alerts and Limit Breaches) and rejected if limits are breached.

A persisted order will be removed at the end of the trading day if any of the following conditions apply:

- Expiry date has passed for a Good Till Date order*
- Last trading date for the tradable instrument has passed
- To prevent restatement into the Tom order book
- Any other exchange specific configuration for order expiry
- Strategy contains a leg that has expired or meets any of the conditions above
- Legs of a strategy have the same prompt date as illustrated by the following example. See also Merged Order Books.

*Note where the expiry date is a non-business date, the order will expire on the next trading date.

Example: Legs of a strategy with a rolling prompt merge

Assume the current trading day is 18 September and the following prompt dates:

Order book	Prompt date
M1	21 Oct

Order book	Prompt date
M2	18 Nov
3M	18 Dec
M3	19 Dec

The following persisted orders rest in their respective order books:

Order book	Bid	Offer
3M-M3	22 (8)	

On the next trading day, 19 September, 3M-M3 merge as the legs share the same prompt date, 19 December. The resulting order book is invalid and the order is removed.

On the following trading day, 20 September, M3-3M is a completely separate strategy from the previous 3M-M3, as leg directions have reversed.

2.1.7.2   Order Types and Permitted Order Validity Conditions

The LME will define the order types and validity conditions that are applicable to specific products.

Order Type	Day	*FOK*	IOC	GTC	GTD
Limit	✔	✔	✔	✔	✔
Market	✔	✔	✔	✔	✔
Stop	✔			✔	✔
Iceberg	✔			✔	✔
OCO	✔			✔	✔
Post Only	✔			✔	✔

2.2   Order Management

2.2.1 Submission

During pre-open and open, new orders can be submitted by a trading application using a connection to an Order Entry Gateway.

It is possible to submit orders for futures, *options* and strategies using any of the order types in combination with validity conditions, see Order Types and Permitted Order Validity Conditions. *Orders can also be submitted in bulk using mass quotes (see* Mass Quotes*).*

LMEselect v10 imposes a restriction on inbound message traffic at user level which specifies the number of orders permitted per second, see Inbound Message Throttle.

In specific markets, orders can be subject to a fixed minimum delay (speed bump) on order submission and amendment messages, see Speed Bumps.

2.2.2 Order Validation

All incoming orders are subject to validation. Session level validation is performed by the Order Entry Gateway on the user and the message. If the user or message fails validation the order is rejected.

Orders are validated against risk limits to protect against over exposure (see Pre Trade Risk Management) and price limits (see Price Bands/Limits).

Stop *and Stop elements of OCO* orders in futures contracts are not validated against dynamic price bands but are only subject to a Stop price tolerance check, see Price Bands/Limits for Stops and Price Bands/Limits for OCOs for examples. The LME accept that in edge cases it is possible for a triggered Stop Limit order to trade through price bands.

Stop and OCO orders in option contracts are not validated against the Stop price tolerance check at order entry and amendment but are validated against the price band when the Stop order is triggered. If the triggered Stop order's limit price is outside the price band it is assigned the most stringent price band (ie, the lower of the upper dynamic and static price band or the higher of the lower dynamic and static price band).

LMEselect v10 performs the following checks on the order:

- Permitted in the trading state
- Does not exceed minimum or maximum quantity or price or the tick size for the tradable instrument
- Valid expiry date
- Valid order type and validity combination, see Order Types and Permitted Order Validity Conditions
- Valid order attributes and combination of attributes including mandatory MiFID fields
- *Icebergs are also subject to additional quantity checks on the minimum notional value and on the visible quantity to ensure it is less than the total quantity and a minimum ratio of the total quantity.*

Any order failing validation is rejected.

Once an order is added to the order book, it receives a priority timestamp, see Timestamps.

2.2.3 Amendment

An order submitted in the order book can be amended by the originator during pre-open and open but not under state conditions such as trading halt or trading pause. During post trade only GTC and GTD orders can be amended.

The following order attributes can be modified:

- Price
- Stop price
- Quantity
- *Visible quantity of an Iceberg*
- Expiry date of a GTD
- *Trigger price of OCO Stop*
- *Price of triggered OCO Stop*
- MiFID II related reporting identifiers:

    - Investment decision within firm
    - Execution decision within firm

- Investment decision country
- Execution decision country
- Client branch country

- Order origination (direct electronic access indicator)
- Order restrictions (algorithmic or non-algorithmic indicator)
- Trading capacity (agency, principal or riskless principal)
- Order attribute type (aggregated order, pending allocation, liquidity provision or risk reduction)
- Text.

An order cannot be amended if it has been completely filled or been cancelled or has expired.

Any Stop attributes cannot be modified if the Stop order has been triggered.

An amendment to an order can affect the order priority if the order price, quantity or if the expiry date for a GTD order is changed, see Timestamps.

Overall risk utilisation will be recalculated whenever orders *and quotes* are amended, see Pre Trade Risk Management.

2.2.4 Cancellation

Orders resting in the order book can be cancelled individually or in bulk. Order cancellation is permitted in pre-open, open, post trade and during a trading pause.

An individual order can be cancelled using an Order Cancel Request message and specifying the original client order ID.

Multiple orders can be cancelled by the originator by specifying which orders are to be cancelled:

- All orders
- All for a specified contract eg, Aluminium future
- All for a specified contract and side of the market
- All for a tradable instrument[1]
- All for an end client account.

Orders submitted as quotes via the binary protocol can be cancelled individually by reducing the quantity of individual quotes to zero. Mass quotes can also be cancelled in bulk by specifying which quotes are to be cancelled:

- *All quotes*
- *All quotes within a mass quote*
- *All quotes for a specified contract*
- *All quotes for a tradable instrument.*

Both orders and quotes can be cancelled in the same instruction by specify the scope of the cancellation in the request.

---

[1] A mass cancellation request for a tradable instrument will not result in the cancellation of any orders in a merged tradable instrument. Orders will only be cancelled in the tradable instrument identifier specified in the cancellation request.

The LME are also able to cancel orders *and quotes* individually or in bulk.

All orders (day and persisted) will be automatically cancelled if a trading halt is invoked by the LME.

LME can disable accounts at user or member level in which case all orders are pulled (including persisted orders).

Overall risk utilisation will be recalculated whenever orders *and quotes* are cancelled, see Pre Trade Risk Management. LME or member risk managers can enact the kill switch to either, pull orders and prevent trading activity or prevent order submission but allow a user to cancel their orders, see Kill Switch.

Mass quotes, day and GTD orders expiring on the current date are automatically cancelled when the order book enters the closed state.

Orders are not automatically cancelled when a user logs out. A user should explicitly cancel such orders prior to logout.

2.2.4.1   Cancel on Disconnect

On order submission a user can specify whether non-persisted orders should be cancelled on system disconnection. For example if the gateway detects a network level disconnection from the member session without a logout message being received prior to disconnection or member session is inactive with no heartbeats being received for the specified interval of time. LMEselect v10 will cancel orders on disconnect on a best efforts basis. It should be noted that during the period it takes to recognise a connection failure (as determined by the member configured heartbeat interval) an existing order can be executed.

Cancel on disconnect functionality is not applicable to GTC/GTD orders, see Persisted Orders.

Mass quotes are classified as day orders and are therefore automatically cancelled on disconnect.

2.2.5   Order Identification

On order submission a client order ID is specified by the originator. When an order is accepted, LMEselect v10 assigns an order ID that is unique for all orders *and quotes*. The order ID remains unchanged for the lifetime of the order.

The original client order ID is used to identify the order when modifying or deleting an order. If the order ID is also specified LMEselect v10 will validate whether the order ID is associated with the correct order.

LMEselect v10 maintains an order version number which is initialised to 0 for new orders and incremented for each order maintenance activity which updates the order priority.

2.2.6   Inflight Order Processing

The Order Entry Gateway will accept a single inflight amendment or cancellation request for a parent order whilst processing that order. An order amendment for the parent order will be queued by the gateway until the parent order has been processed. An additional inflight amendment for the parent order will be rejected. Similarly an order cancellation can be submitted for the parent order whilst it is being processed. The request will be queued by the gateway until the parent order has been processed.

An inflight amendment followed by a cancellation for the parent order will be accepted. The cancellation will be processed in sequence (after the amendment).

2.2.7   Timestamps

The Order Entry Gateway assigns an entry timestamp to an order when an order is received. The time that an order is received determines the sequence in which it is processed. *This can be affected by the presence of a speed bump.*

A priority timestamp is assigned by LMEselect v10 at the point the order passes order entry validation *and has completed any configured speedbump*. The priority timestamp is used to determine order allocation during matching, see Price-Time.

The priority timestamp of an order will be updated in the following circumstances:

- Limit price is modified
- Total order quantity is increased
- *Visible quantity of an Iceberg order is increased*
- Change to the stop price of an untriggered stop order
- *Change to stop elements of an untriggered OCO*
- Triggering of a stop order *or an OCO order*
- Order validity is extended.

The priority timestamp of an implied order will be updated by a change to the order priority of a parent order or a change to the combination of parent orders as a result of an order action such as amendment, cancellation or trade execution.

A persisted order will retain its order priority when it is restated.

Where a matched trade has a price improvement to be allocated, including price improvements due to implied rounding, the overall timestamp is used to determine the price taker. This is the order to which the price improvement is allocated. For an explicit order this is the priority timestamp allocated by the price-time algorithm. For an implied order this is the timestamp of the youngest parent of the implied order.

The priority timestamp will also be used determine the price taker for price improvements from implied generation during uncrossing and as a result of the implied order price moving inside price bands/limits.

2.2.8   Mass Quotes

Multiple orders can be submitted in pre-open and open using a Mass Quote message available via the binary protocol. Up to 20 quote pairs can be submitted in multiple tradable instruments in a single contract and up to three price levels per side can be submitted within a single tradable instrument.

Each quote pair is validated, if one side of a quote pair fails validation then that pair is rejected. The entire mass quote will be rejected if quotes for different contracts have been specified for example, Nickel future and Nickel option. Crossed quotes submitted in the same quote pair will be rejected but will be executed if supplied in different price levels as shown in Example 1.

Once a quote has been accepted it is assigned an order ID and time priority and is valid for the day.

Quote entries within a mass quote can be updated by sending replacement quotes to update both sides of a quote entry or a single side of a quote pair leaving the other side unchanged. Where a side is unchanged there will be no impact to its time priority. A mass quote can also be used to cancel both sides of a quote entry or cancel a single side or a cancel and update quote entries simultaneously. Cancellation is indicated by zero values for bid or offer quantity.

During mass quote processing, resting quotes that will be updated are removed to prevent execution with replacement quotes. Should a replacement quote fail validation for example, price limits or risk limits, the original quote will not be reinstated.

Mass cancellation can be performed on orders entered as mass quotes, see Cancellation.

Quotes will be cancelled when the contract enters close.

Example 1: Crossed quotes

A Market Maker submits the following quote pairs in the M1 order book as part of a mass quote:

Quote Entry	Bid	Offer
1	6904 (10)	6906 (11)
2	6905 (5)	6904.5 (8)
3	6906 (2)	6908 (7)

The bid for 6905 for 5 lots and offer at 6904.5 for 8 lots in quote entry 2 can trade with each other and are rejected as quote pair.

The bid for 6906 for 2 lots in quote entry 3 and offer at 6906 for 11 lots in quote entry 1 will trade unless self-execution prevention has been specified, see Self-Execution Prevention.

Example 2: Replacement and cancellation

A Market Maker submits the following quote pairs as part of a mass quote:

Quote Entry	Order book	Bid	Offer
1	CA Jul22 C5900	10.5 (10)	11.5 (10)
2	CA Jul22 C5900	10 (10)	12 (10)
3	CA Jul22 C5900	9 (10)	13 (10)
4	CA Jul22 C6000	12 (10)	13 (10)
5	CA Jul22 C6000	11 (10)	14 (10)

The Market Maker then sends the following replacement quotes:

Quote Entry	Order book	Bid	Offer
1	CA Jul22 C5900	9 (10)	10 (10)
2	CA Jul22 C5900	8 (10)	11 (10)
3	CA Jul22 C5900	7 (10)	12 (10)
4	CA Jul22 C6000	10 (10)	11 (10)

Quote Entry	Order book	Bid	Offer
5	CA Jul22 C6000	11 (0)	14 (0)

Removal of the resting quotes prior to replacement prevents the following replacement quotes executing:

- *Incoming offer at 10 in quote entry 1 will not execute against the resting bid for 10.5 in quote entry 1.*
- *Incoming offer at 11 in quote entry 4 will not execute against the resting bid for 11 in quote entry 5.*

2.2.9   Market Maker Protection (MMP)

Market Maker Protection functionality provides a mechanism to limit the number of trade executions on orders and quotes within a specific time frame.

MMP functionality will be available to permissioned trading users. A member risk manager will use the risk management interface to specify the level of protection that should apply to a trading user in a particular contract as described in Market Maker Protection Configuration. *The protection limit assigned to a protection type will be validated against the LME defined minimum threshold.*

The following protection types are available to be configured:

- *Cumulative percent over time*

  Total percentage of orders and quotes executed within the configured time frame

- *Volume over time*

  Total count of volume executed within the configured time frame

- *Number of tradable instruments traded over time*

  Total count of option tradable instruments in which orders execute within the configured time frame.

The time frame is set in seconds with the minimum time frame being 1 second. The calculation uses a rolling time frame which is based on an absolute rather than a sliding second.

If a limit is breached the protection response is invoked to pull orders and reject further orders. This prevents any additional matching therefore ensuring that the trader receives no additional fills beyond the one which triggered the MMP. The trader will receive notification of the protection type that has been breached along with the order cancellations. Any subsequent submissions will be rejected until MMP is explicitly reset by the user. Resetting will reinstate MMP and allow order submission.

Market Maker Protection functionality will be operational during market open but will not be applied during the first stage of uncrossing (see Uncrossing*).*

Example 1: Cumulative percent over time

For this protection type, a protection limit of 200% has been set with a protection time frame of 1 second.

A Market Maker submits the following quote pairs as part of a mass quote:

Order book	Bid	Offer
AH Dec22 P1750	20.00 (10)	25.00 (11)
AH Dec22 P1775	28.00 (5)	32.00 (8)

Order book	Bid	Offer
AH Dec22 P1800	40.00 (6)	44.00 (8)

The quotes begin to trade with the following incoming orders:

- An incoming offer in AH Dec24 P1750 trades 3 lots at 19.00 resulting in 30% of the order traded.
- An incoming offer in AH DEC24 P1775 trades 5 lots at 28.00 resulting in 100% of the order traded.
- An incoming bid in AH DEC24 P1800 at 45.00 for 7 lots trades resulting in 87.5% of the order traded.

As the total accumulated percentage of the trades' equals 217.5% it breaches the 200% limit and the protection response is invoked (ie, the remaining quotes are pulled from the order book and further quote submissions are rejected).

Example 2: Volume over time

For this protection type, a protection limit of 200 has been set with a protection time frame of 1 second.

A Market Maker submits the following quotes as part of a mass quote:

Order book	Bid	Offer
CA Mar23	6911 (44)	6913 (60)
CA Apr23	6911 (28)	6913 (25)
CA May23	6911 (20)	6913 (35)

The mass quote is accepted even though the total order quantity is greater than the 200 lot protection limit. The protection limit is only invoked once the volume limit is breached during trading.

The quotes begin to trade with the following incoming orders which execute fully:

- An incoming offer in May23 for 20 lots trades at 6911.
- An incoming bid in Mar23 for 60 lots trades at 6913 resulting in 80 lots traded in total.
- An incoming bid in Apr23 for 25 lots trades at 6913 resulting in 105 lots in total.
- An incoming offer in Apr23 for 28 lots trades at 6911 resulting in 133 lots in total.
- An incoming offer in Mar23 for 44 lots trades at 6911 resulting in 177 lots in total.

An incoming bid in May23 for 35 lots at 6913 will trade out the remaining quote volume resulting in 212 lots traded in total. The protection response will then be invoked.

Example 3: Number of tradable instruments traded over time

For this protection type, a protection limit of 3 tradable instruments has been set with a protection time frame of 1 second.

A Market Maker submits the following quote pairs as part of a mass quote:

Order book	Bid	Offer
AH Dec23 C1900	54 (6)	56 (13)
AH Dec23 C1925	57 (3)	58 (10)

Order book	Bid	Offer
AH Jan24 P2000	64 (6)	66 (11)
AH Feb24 C2025	62 (15)	63.5 (12)
AH Feb24 P2050	66.5 (3)	68 (7)

The quotes begin to trade with the following incoming orders:

- *An incoming offer in AH Dec23 C1900 for 5 lots trades at 54*
- *An incoming bid in AH Dec23 C1900 for 10 lots trades at 56*
- *An incoming bid in AH Dec23 C1925 for 7 lots trades at 58.*

An incoming offer in AH Feb24 C2025 for 3 lots trades at 62. The protection response will then be invoked and the remaining quotes will be pulled from the order book.

2.2.9.1 Reset Market Maker Protection

A trader can reset MMP once the protection response has been invoked to pull orders and prevent order submission. The MMP reset will only affect the MMP limit that has been breached.

Upon receipt of an MMP protection reset, LMEselect v10 will reset the MMP limit count to 0 and immediately reset the MMP limit to the previously configured value. Once MMP is reset order and quote submission is permitted.

Note MMP reset functionality will only be available via the binary protocol.

2.2.10 Request for Quote (RFQ)

An RFQ indicates a trading interest in a specific instrument. The RFQ is routed by LMEselect v10 to LMEsource.

RFQs can only be sent during pre-open and open when a response can be expected. Trading participants respond to an RFQ using standard order and quote functionality however a response during pre-open will not be visible until after the contract moves into market open.

2.2.11 Inbound Message Throttle

The number of incoming messages that can be submitted by a user are subject to restrictions. An order throttle is configured for each user (Comp ID) which protects LMEselect v10 from excessive message traffic by rejecting orders submitted over a message threshold limit within a specific period, for example one second.

The message counter uses an absolute rather than a sliding second.

For example, if the inbound message throttle for a user is set at 40 messages per second and the user submits the full 40 order / *quote* actions within the first 250 milliseconds of that second, any further orders will not be accepted by the Gateway for the next 750 milliseconds.

Order *and quote* submissions, amendments, *RFQs,* Security Definition Requests *and MMP resets* are included in the count of messages. *Each mass quote message is counted as a single message irrespective of the number of quote pairs present in the message.*

Cancellation messages are exempt from throttling.

Security Definition Requests are included in the message throttle but also have their own throttle limits which are set at a per day rate. A user breaching the daily limit will have further message submissions rejected by the gateway.

A system protection throttle will disconnect a user if the incoming message volume exceeds a multiple of the threshold limit. Reconnection is permitted after a second.

Messages submitted on the Risk Management Gateway will also be throttled.

2.2.12 Speed Bumps

The LME can specify a predefined delay to incoming orders submitted by traders.

A speed bump is configured in milliseconds at market segment level and will only be applied during market open to new order submissions and amendment requests. Passive orders that rest in the order book, order cancellations, stops and mass quotes are exempt.

Risk limit and business validation is performed prior to speed bump application. The originating trader is notified that their order has been accepted but is subject to a speed bump delay.

If an order is determined to be executable on order submission or amendment it will be entered into the speed bump. If the order is determined to be non-executable (ie, it will rest in the order book) it is immediately entered into the order book and bypasses the speed bump.

If an order amendment is submitted for an order currently in a speed bump, the execution check will determine whether the request is speed bumped or processed immediately after the original order has cleared the speed bump and been added to the order book.

An order cancellation submitted while an order is in a speed bump will be processed without any delay.

Once an order clears the speed bump, it is revalidated against price bands/limits and the current market state. An execution check is performed on orders with IOC and FOK validity conditions and will be cancelled if the order cannot be fulfilled.

The order receives a priority timestamp when it is added to the order book and utilisation is updated.

The LME can enable or disable a speed bump at market segment level and set the delay interval at market segment level in the product hierarchy, see Appendix A.

2.2.13 Merged Order Books

The LME prompt date structure for futures is such that different prompts in a contract can share the same actual date on specific trading dates, for example, on the 3rd Wednesday of a month a 3M (rolling) tradable instrument will have the same prompt date as the equivalent monthly (single) tradable instrument. On the trading date on which the prompts share the same actual date, the order books for both prompts will be merged into a single order book.

Carry strategies that include a rolling leg will also merge. This can occur if a Carry has a leg or legs with calendar dated equivalents of the rolling tradable instrument.

The merging of order books only affects execution and market data publication. Tradable instruments in the merged order book will be available for order entry. Execution Reports will be returned using the tradable instrument in which the order was submitted. The instrument identifier of the rolling tradable instrument will take precedence as shown in the following examples and will be used to publish market data updates of merged books on LMEsource.

GTC and GTD orders entered into either rolling or single tradable instruments will be restated in the merged order book and will revert to the order book into which they were entered when the order books are no longer merged.

Example 1: 3M and monthly tradable instruments merge

Assume the current trading day is 18 March and the following order books contain persisted orders.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
3M	125	125	18 Jun	1803 (10)	N/A
M3	458		19 Jun	1803 (5)	N/A

On 19 March both order books share the same prompt date and are merged into a single order book with the 3M order book taking precedence. The 3M order book contains a total volume of 15 lots at 1803:

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
3M	125	125	19 Jun	1803 (10)	1803 (15)
M3	458	125	19 Jun	1803 (5)	

On 20 March the order books separate and contain their respective orders.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
3M	125	125	20 Jun	1803 (10)	N/A
M3	458		19 Jun	1803 (5)	N/A

Example 2: Cash and single tradable instrument merge on consecutive days due to a US holiday

A tradable instrument will not be listed with a prompt date that coincides with a US holiday. When a US holiday falls on a UK trading day, two consecutive UK trading days will have the same Cash tradable instrument resulting in two order books being merged for two consecutive days.

Assume the current trading day is 18 March, with a US holiday on 21 March.

The following persisted orders rest in their respective order books:

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
Cash	111	111	20 Mar	1803 (10)	N/A

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
22 Mar	321		22 Mar	1803 (15)	N/A
23 Mar	322		23 Mar	1803 (5)	N/A

On 19 March, the Cash tradable instrument shares the same prompt date as the 22 Mar tradable instrument due to the US holiday on 21 March. The Cash and 22 Mar tradable instruments are merged into a single order book with the Cash order book taking precedence. The Cash merged order book contains a total volume of 25 lots at 1803:

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
Cash	111	111	22 Mar	1803 (10)	1803 (25)
22 Mar	321	111	22 Mar	1803 (15)	
23 Mar	322		23 Mar	1803 (5)	N/A

On 20 March, Cash still shares the same prompt date as 22 Mar and the order books remain merged.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
Cash	111	111	22 Mar	1803 (10)	1803 (25)
22 Mar	321	111	22 Mar	1803 (15)	
23 Mar	322		23 Mar	1803 (5)	N/A

On 21 March the order books separate and the persisted order in 22 Mar is automatically cancelled to prevent it from merging with Tom, see Persisted Orders.

The Cash tradable instrument now shares the same prompt date as the 23 Mar. The Cash and 23 Mar tradable instruments are merged into a single order book. The Cash merged order book contains a total volume of 15 lots at 1803:

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt Date	Volume per Tradable Instrument	Overall merged volume
Cash	111	111	23 Mar	1803 (10)	1803 (15)
23 Mar	322	111	23 Mar	1803 (5)	

Example 3: Carry with a rolling leg merges with a Carry with dated equivalent legs

Assume the current trading day is 18 September and the following order books contain persisted orders.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
M1	456		21 Oct		N/A
M2	457		18 Nov		N/A
3M	125	125	18 Dec	Bid 10 (2)	N/A
M3	458		19 Dec	Bid 10 (5)	N/A
M1-3M	777	777	21 Oct-18 Dec	Bid 20 (3)	N/A
				Offer 22 (2)	N/A
M1-M3	789		21 Oct-19 Dec	Offer 22 (8)	N/A

On 19 September both Carry tradable instruments share the same prompt date and are merged with the M1-3M order book taking precedence.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
M1	456		21 Oct		N/A
M2	457		18 Nov		N/A
3M	125	125	19 Dec	Bid 10 (2)	Bid 10 (7)
M3	458	125	19 Dec	Bid 10 (5)	
M1-3M	777	777	21 Oct-19 Dec	Bid 20 (3)	Bid 20 (3)
				Offer 22 (2)	Offer 22 (10)
M1-M3	789	777	21 Oct-19 Dec	Offer 22 (8)	

On 20 September the order books separate and contain their respective orders.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
M1	456		21 Oct		N/A

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
M2	457		18 Nov		N/A
3M	125	125	20 Dec	Bid 10 (2)	N/A
M3	458		19 Dec	Bid 10 (5)	N/A
M1-3M	777	777	21 Oct-20 Dec	Bid 20 (3) Offer 22 (2)	N/A N/A
M1-M3	789		21 Oct-19 Dec	Offer 22 (8)	N/A

Example 4: Carry with two rolling legs merges with multiple Carries containing dated equivalent legs

Assume the current trading day is 14 May and the following order books contain persisted orders. The order books of the dated equivalents of Cash-3M are merged into the Cash-3M order book which takes precedence. The Cash-3M merged order book contains a total volume of 21 lots at 1803:

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
Cash-3M	123	123	16 May-14 Aug	1803 (10)	1803 (21)
16 May-3M	246	123	16 May-14 Aug	1803 (7)	
Cash-14 Aug	333	123	16 May-14 Aug	1803 (3)	
16 May-14 Aug	654	123	16 May-14 Aug	1803 (1)	
17 May-15 Aug	656		17 May-15 Aug	1803 (5)	N/A

On 15 May the order books separate and contain their respective orders. The tradable instruments remain valid however the orders in 16 May-3M and 16 May-14 Aug which have actual date prompts of 16 May are automatically cancelled due to order expiry conditions, see Persisted Orders.

Cash-3M now shares the same prompt dates as 17 May-15 Aug resulting in these order books being merged. The Cash-3M merged order book contains a total volume of 15 lots at 1803:

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
16 May-3M	246		16 May-14 Aug		N/A
Cash-14 Aug	333		17 May-14 Aug	1803 (3)	N/A

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
16 May-14 Aug	654		16 May-14 Aug		N/A
Cash-3M	123	123	17 May-15 Aug	1803 (10)	
17 May-15 Aug	656	123	17 May-15 Aug	1803 (5)	
Cash -15 Aug	657	123	17 May-15 Aug		1803 (15)
17 May-3M	658	123	17 May-15 Aug		

Note, 16 May-3M and 16 May-14 Aug will also be merged however this is not shown as this example just illustrates the merging of Cash.

On 16 May the order books separate and contain their respective orders. The tradable instruments remain valid however the order in 17 May-15 Aug is cancelled due to order expiry conditions.

Tradable Instrument	Tradable Instrument ID	Merged Instrument ID	Prompt date	Volume per Tradable Instrument	Overall merged volume
Cash-14 Aug	333		18 May-14 Aug	1803 (3)	N/A
17 May-15 Aug	656		17 May-15 Aug		N/A
Cash-3M	123	123	18 May-16 Aug	1803 (10)	
18 May-16 Aug	789	123	18 May-16 Aug		
Cash -16 Aug	790	123	18 May-16 Aug		1803 (10)
18 May-3M	791	123	18 May-16 Aug		

2.3 Order Matching

2.3.1 Trading Algorithms

2.3.1.1 Price-Time

Every accepted order and implied that is created is assigned an entry timestamp and a priority timestamp, see Timestamps.

The price-time algorithm matches displayed order quantity at the best price level by priority timestamp starting with the oldest orders ie, First In, First Out (FIFO). *Any residual quantity is allocated to Iceberg orders hidden quantity in timestamp sequence.* This is repeated at each price level until crossed prices and quantity has been exhausted, see Order Execution Processing.

Orders at the same price are filled in the sequence they were entered into the order book with the oldest order at that price having the highest priority and being matched first.

Note: where chaining is not implemented implied orders will be created from the highest priority explicit order (ie will not be created from other implied prices), see Implied Trading.

Example 1: Time priority

Assume the current date for 3M is 24 August 2024.

Assume that the following orders shown with timestamps are in the market:
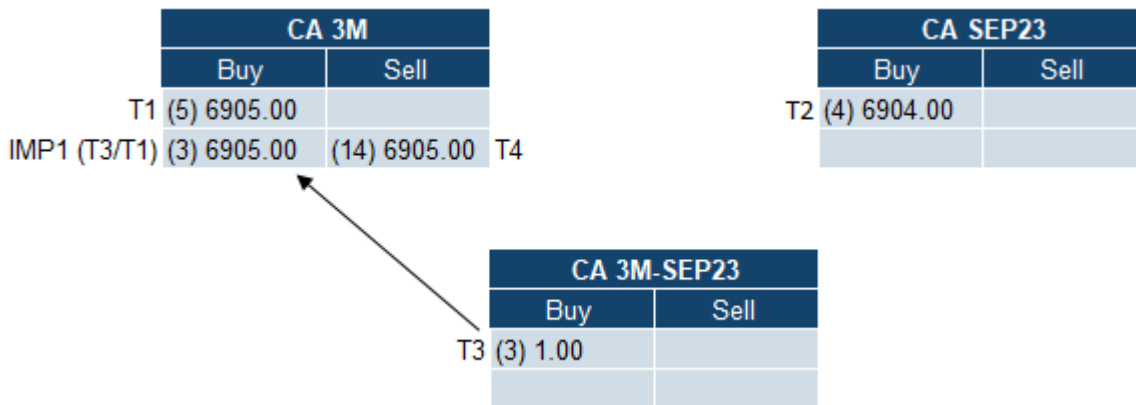
A CA 3M offer T4 is submitted at 6905.00 for 14 lots which enable the resting bids to trade.

As all the order prices are the same the orders are matched according to time priority as follows:

- CA 3M bid T1 trades 5 lots at 6905.00
- CA 3M implied T1/T2 trades at 6905.00 comprised of the following explicit orders:

  - CA 3M-Sep23 bid T1 trades 3 lots at 1.00
  - CA Sep23 bid T2 trades 3 lots at 6904.00

Example 2: Best price

Assume the following orders shown with timestamps are in the market:
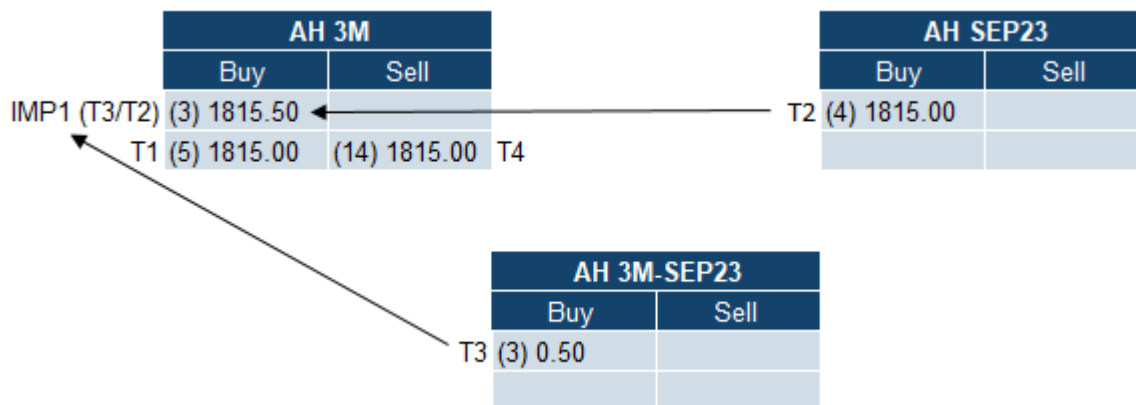
An AH 3M offer T4 is submitted at 1815.00 for 14 lots which enable the resting bids to trade.

The following trades occur according to best price:

- AH 3M implied at 1815.50 comprised of the following orders:

    - AH 3M-Sep23 bid T3 trades 3 lots at 0.50
    - AH Sep23 bid T2 trades 3 lots at 1815.00

- AH 3M bid T1 trades 5 lots at 1815.00.

2.3.2 Indicative Opening Price (IOP)

The Indicative Opening Price (IOP) is the predicted opening trade price and volume which is calculated using the uncrossing algorithm during pre-open.

If there are no crossed prices, no IOP is calculated or disseminated. If a tradable instrument does not have a crossed order book but does have both a bid and offer price then a mid-price will be calculated and published instead of the IOP. It will be identified as the Indicative Opening Mid-Price (IOMP). This is only calculated if there is a bid and offer price and the bid / offer spread is within a percentage tolerance of the previous electronic closing price for the prompt. For the Tom prompt, this is the previous day's Cash closing price. For a merged order book, the previous day's closing price is that of the prompt that takes precedence, see Merged Order Books.

The aim of uncrossing is to achieve a price at which the most volume is traded.

IOPs are only calculated for outright and strategy order books. Implied prices are not included in the calculation. The dissemination of the IOP only occurs when the recalculated price changes from that previously issued.

If a state condition is imposed during pre-open, a trading halt will result in the cancellation of all orders and therefore no further indicative prices will be generated. A trading pause will retain orders and permit cancellation by the originator which may result in an updated indicative price.

2.3.3 Uncrossing Algorithm

The uncrossing algorithm calculates the IOP during pre-open and performs uncrossing at the start of open.

To illustrate how the IOP is calculated, assume the following orders have been submitted in pre-open:

	Bid	Offer
	T1 6912 (13)	T2 6908 (7)
Total quantity	*13*	*7*

The uncrossing algorithm uses the following steps to determine the IOP:

1. Select the price that would result in the highest traded volume.

2. If more than one price achieves the highest traded volume then select the price that would result in the lowest residual volume.

As the table shows both prices in the order book can trade the most volume in which case the next step is followed:

3. If more than one price satisfies these conditions then select the:

    (a) Bid price where there is more residual bid volume than residual offer volume

    (b) Offer price where there is more residual offer volume than residual bid volume.

4.   If more than one price achieves the highest traded volume and the residual bid and offer volumes are equal then select the mid-point between the high and low of such prices. If the mid-point is not tick aligned it should round to the nearest tick.

Note in the following examples the price that results in the highest traded volume is shown in red and in bold.

As 6912 is the highest price it is used as the IOP.

Bid quantity	Price	Offer quantity	Traded volume	Difference	Residual bid quantity	Residual offer quantity
13	**6912**	**7**	**7**	**6**	**6**	**0**
13	6908	7	7	6	6	0

Assume another order an offer (T3) enters the same order book:

	Bid	Offer
	T1 6912 (13)	T2 6908 (7)
		T3 6909 (5)
Total quantity	*13*	*12*

As the table below shows the highest traded volume can be achieved by two prices (6912 and 6909) therefore highest price which results in a residual bid quantity greater than a residual offer quantity is 6912. The T2 offer (6908) is disregarded as at that price volume matched will not be maximised.

Bid quantity	Price	Offer quantity	Traded volume	Difference	Residual bid quantity	Residual offer quantity
13	**6912**	**12**	**12**	**1**	**1**	**0**
13	6909	12	12	1	1	0

Assume another order an offer (T4) enters the order book:

	Bid	Offer
	T1 6912 (13)	T2 6908 (7)
		T3 6909 (5)
		T4 6910.5 (3)
Total quantity	*13*	*15*

As the table below shows the highest traded volume can achieved by two prices (6912 and 6910.5) as bid volume will be traded out the following step is followed:

If more than one price satisfies these conditions (ie leave the order book uncrossed) then select the low of prices offering the highest traded volume.

Bid quantity	Price	Offer quantity	Traded volume	Difference	Residual bid quantity	Residual offer quantity
13	6912	15	13	-2	0	2
13	**6910.5**	**15**	**13**	**-2**	**0**	**2**

Assume another order a bid (T5) enters the order book:

	Bid	Offer
	T5 6913.5 (6)	T2 6908 (7)
	T1 6912 (13)	T3 6909 (5)
		T4 6910.5 (3)
Total quantity	19	15

As the table below shows the highest traded volume can achieved by two prices (6912 and 6910.5) therefore highest price which results in a residual bid quantity greater than a residual offer quantity is 6912. At a price of 6909 and 6908 the order book will not be fully uncrossed.

Bid quantity	Price	Offer quantity	Traded volume	Difference	Residual bid quantity	Residual offer quantity
6	6913.5	15	6	-9	13	9
19	**6912**	**15**	**13**	**-2**	**4**	**0**
19	6910.5	15	13	-2	4	0
19	6909	12	12	7	7	3
19	6908	7	7	12	12	8

2.3.4 Uncrossing

During the pre-open, no order matching occurs and limit orders resting in the order book may be crossed (ie, the best bid price can be greater than or equal to the best offer). During market open, it is not permitted for crossed orders to rest in the order book. It is therefore necessary to "uncross" as the first action when moving into market open. The uncrossing algorithm matches any crossed orders and calculates the opening trade price(s).

Order submission, amendment and cancellation requests are permitted during uncrossing but requests are queued until uncrossing has been completed.

Under trading halt or trading pause conditions uncrossing will not be performed.

2.3.4.1 Sequence of Uncrossing

The uncrossing algorithm will match explicit orders in individual outright order books by time to expiry ie, from the nearest dated expiry and then every other expiry in chronological order.

For futures, TAS order books will uncross immediately after their respective parent order book.

For options, the strikes uncross from the at-the-money strike, then the nearest in-the-money call, then nearest in-the-money put, then nearest out-the-money call, then nearest out-the-money put, continuing until all strikes within the expiry are uncrossed.

Explicit orders in strategy order books uncross according to time to expiry based upon the front leg ie, from the nearest dated expiry. If more than one strategy has the same time to expiry for the front leg then time to expiry of the back leg (earliest first) is used to determine the next strategy to be uncrossed. For example, if two Carry strategies have the same front month, Nov-Dec will be uncrossed before Nov-Jan.

Note that this is the first stage of uncrossing which is considered the opening trade price. The following two (potentially repeated) stages whilst still part of uncrossing are not considered part of the opening trade price.

Stop orders triggered by uncrossing will be entered into their respective order book in price-time priority. The algorithm will uncross explicit orders against the triggered Stop orders in outright and strategy order books using time to expiry. Further Stop orders may be triggered as a consequence of this process.

Implied ins will be generated first followed by implied outs and will uncross in time to expiry order, see Implied Trading. The generation of implieds can trigger Stop orders which will uncross in their respective order book, if applicable.

2.3.4.2   Allocation of Prices to Trades during Uncrossing

Example 1: Uncross according to time to expiry of the front leg

Assume the current trading day is 15 May 2023 and following outright and strategy orders have been submitted in Aluminium futures in pre-open. For this example the 3M actual prompt date is 15 August and the date for the Aug23 prompt is 17 August 2023:

The uncrossing sequence will uncross according to time to expiry starting with explicit orders in outrights first then explicit orders in strategies. It will then generate the implied in orders in strategy order books according to time to expiry of the front leg, T6 then T7.

The following trades occur:

- T6: implied in offer at -1.00 for 10 lots in Jun23-Aug23 trades with T3 for 10 lots at 1.00 with the implied order receiving the price improvement.
- T7 the implied offer at -1.00 for 8 lots in 3M-Aug23 trades the remaining 5 lots of T2 at 0.79 with the implied order receiving the price improvement.

The residual order book will contain the following resting orders:

JUN 23	
Bid	Offer

3M		
Bid	Offer	
	(3) 1884	T4

AUG 23		
Bid	Offer	
	(3) 1883.21	IMP

	JUN 23/AUG 23	
	Bid	Offer
T3 (2) 1.0		

	3M/AUG 23	
	Bid	Offer
T2 (3) 0.79		
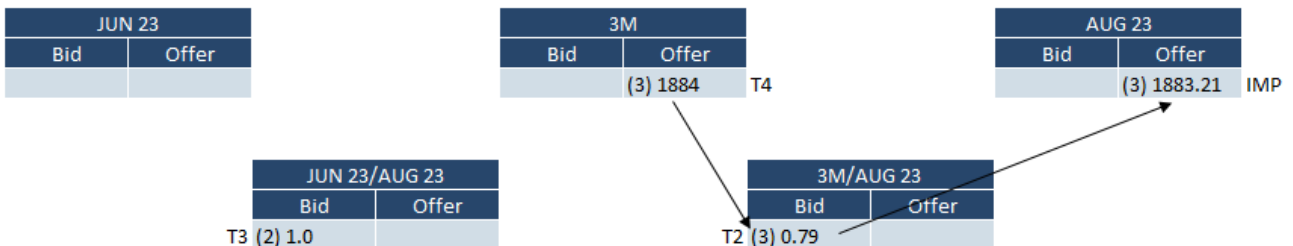
Example 2: Uncross according to time to expiry of the back leg

Assume the following outright and strategy orders have been submitted in pre-open:

3M	
Bid	Offer
T1 (10) 1804	

AUG 23		
Bid	Offer	
	(7) 1803	T2

SEP 23		
Bid	Offer	
	(4) 1802.5	T3

	3M /AUG 23	
	Bid	Offer
	(8) 1.0	T5

	3M/SEP 23	
	Bid	Offer
	(5) 1.5	T4

3M	
Bid	Offer
T1 (10) 1804	

AUG 23		
Bid	Offer	
	(7) 1803	T2

SEP 23		
Bid	Offer	
	(4) 1802.5	T3

	3M /AUG 23		
	Bid	Offer	
IMP T6 (7) 1.0		(8) 1.0	T5

	3M/SEP 23		
	Bid	Offer	
IMP T7 (3) 1.5		(5) 1.5	T4
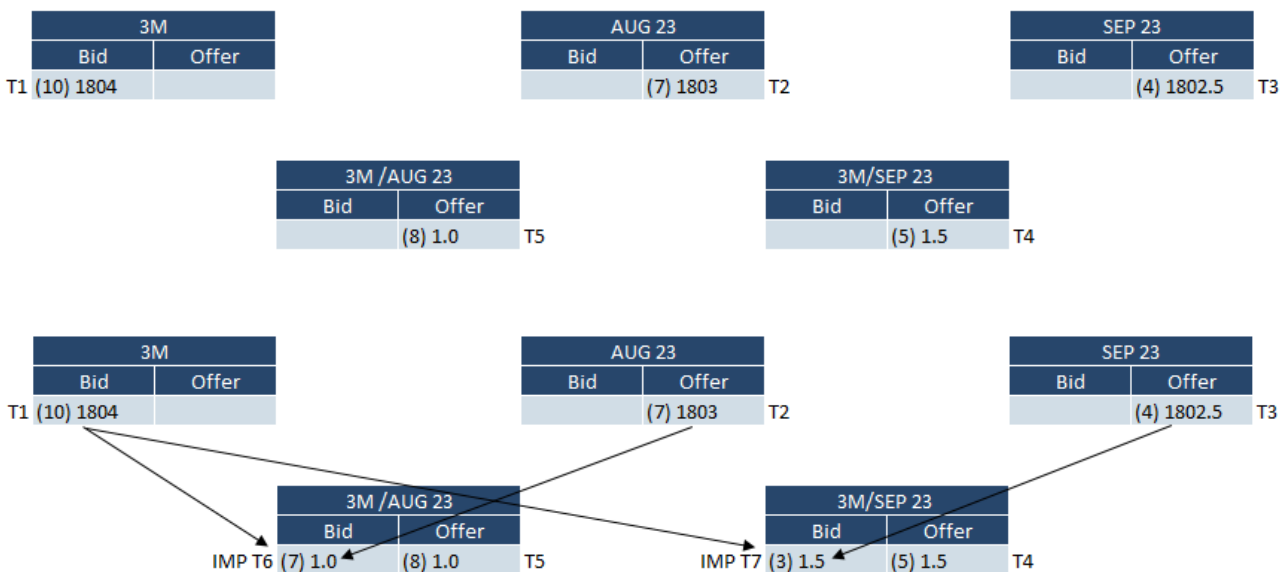
The uncrossing sequence is followed. It will generate implied in orders in strategy order books in time to expiry of the back leg (T6 then T7) with the 3M-Aug23 trading first:

- T6: 3M-Aug23 implied bid trades 7 lots at 1.0
- T1: 3M bid trades 7 lots at 1804
- T2: Aug23 offer trades 7 lots at 1803
- T5: 3M-Aug23 offer trades 7 lots at 1.0.

The 3M-Sep23 implied will trade next:

- T7: 3M-Sep23 implied bid trades 3 lots at 1.5
- T1: 3M bid trades 3 lots at 1804. This is the residual quantity available after 3M-Aug23 has traded.
- T3: Sep23 offer trades 3 lots at 1802.5
- T4: 3M-Sep23 offer trades 2 lots at 1.5.

The residual order book will contain the following resting orders:
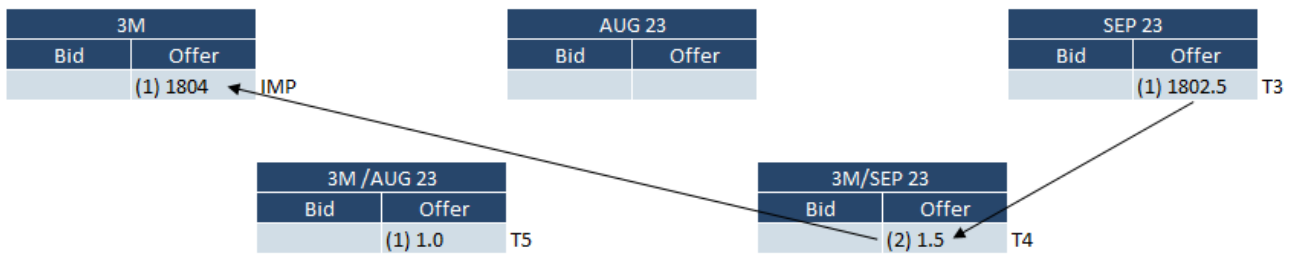
2.3.5 Strategies

A strategy is a tradable instrument that represents a set of other tradable instruments which are known as the 'legs' of the strategy. A strategy can consist of legs that are in the same contract and can involve a combination of buying or selling each of the legs.

2.3.5.1   Strategy Creation

Order books are created for strategy tradable instruments from predefined reference data and in response to creation requests submitted by trading users.

A trader can submit Security Definition Request for an exchange defined strategy type (see Exchange Defined Strategy Types) *or a custom strategy (see* Custom Strategies*). A Delta Hedge strategy can be submitted as a custom strategy, see* Delta Hedge Strategy.

A strategy is defined by specifying the security ID of each of the legs, the leg ratio and leg side. *For example, a futures Butterfly is defined as buy month 1, sell month 2 twice and buy month 3.*

A strategy can be submitted from either a buy or sell perspective but must include the strategy legs in order of expiry. The strategy will be returned from the buy perspective.

2.3.5.2   Exchange Defined Strategy Types

2.3.5.2.1 Futures Strategies

Strategy Name	Definition (from buy perspective)
Carry	Buy near leg, sell far leg
Average 3M	*Buying 3 consecutive (monthly) legs*
Average 6M	*Buying 6 consecutive (monthly) legs*
Average 12M	*Buying 12 consecutive (monthly) legs*
Carry Average	*Buy an outright (eg, 3M), sell an Average future (eg, first quarter 2023)*

Carries support implied trading – implied in and implied out, see Implied Trading.

An Average strategy is only permitted in monthly prompts as consecutive months.

Carry Average is the only permitted nested strategy type. The outright in the Carry Average cannot be included within the Average eg, M1 outright v M1, M2, M3 Average.

2.3.5.2.2 Options Strategies

Strategy Name	Definition (from buy perspective)
Call Spread	Buy a (call) strike, sell a (call) higher strike within the same option expiry
Put Spread	Buy a (put) strike, sell a (put) lower strike within the same option expiry

2.3.5.3 Custom Strategies

A custom strategy can be specified of up to five legs in a futures contract or premium quoted option. Each leg in the strategy must be in the same contract. An exchange defined strategy cannot be used within a custom strategy.

2.3.5.4 Delta Hedge Strategy

A Delta Hedge strategy enables a trader to hedge an option position using the related underlying by submitting a custom strategy of up to 5 legs within the same contract with one or two futures legs.

The leg ratio that is assigned to the futures leg is the delta. The underlying price specified is the trade price assigned to the futures delta hedge leg.

The following table lists examples of delta hedge strategies:

Custom delta hedge strategy	Definition (from buy perspective)
Call versus underlying	Buy call, sell underlying
Put versus underlying	Buy put, buy underlying
Call Spread versus underlying	Buy call, sell call at higher strike, sell the underlying
Put Spread versus underlying	Buy put, sell put at lower strike, buy the underlying
Call Butterfly versus underlying	Buy a call. Sell two calls at a higher strike with the same prompt. Buy a call at an even higher strike with the same prompt. Buy or sell the underlying.
Put Butterfly versus underlying	Buy a put. Sell two puts at a higher strike with the same prompt. Buy a put at an even higher strike with the same prompt. Buy or sell the underlying.

2.3.6 Strategy Leg Pricing

An order price for a strategy is specified on submission. When a strategy is traded, LMEselect v10 will calculate a leg price for each leg in the strategy. The traded leg price will be based on the traded net price and the calculated net price based upon the current reference price (as provided by the LME Pricing service) for the contracts traded:

- Live Forward Curve (LFC) price for futures
- *Option Fair Value (OFV) price for options*.

No net price differential will be allocated to 3M or Tom legs. 3M legs will be assigned the LFC price and Tom legs will be assigned the previous day's official Cash settlement price. Net price for a strategy is described as contango represented by a negative price or backwardation represented by a positive price.

Price allocations to legs will be subject to price band/limits.

2.3.6.1 Carries

The LFC price is used as the trade price for near leg of the Carry, the far leg is the adjustable leg except where the strategy contains a Tom or 3M leg in which case it will take precedence.

2.3.6.1.1 Standard Carry

The trade price for leg 2 is calculated by subtracting the Carry trade price from the assigned leg 1 trade price.

Carry	LFC price	Trade price	Leg 1 price	Leg 2 price
CA Feb23-Mar23	1501.60	1.25	1501.60	1500.35

2.3.6.1.2 Carry with a Tom leg for base metals

The trade price for leg 2 is calculated using the previous day's official Cash settlement price minus the traded strategy net price.

Carry	Previous day's official Cash settlement price	Trade price	Leg 1 price	Leg 2 price
AH Tom-Next	1903.14	1.00	1903.14	1902.14
CA Tom-Feb23	6378.14	-0.65	6378.14	6378.79
AH Tom-3M	1904.01	1.00	1904.01	1903.01

2.3.6.1.3 Carry with a 3M leg

The reference price used for a strategy which includes a 3M leg depends on the constituents of the strategy.

The LFC price is used as the 3M leg trade price. If the strategy is a Tom-3M Carry, the Tom leg uses the official Cash settlement price as its trade price as described above.

If the 3M leg is the first leg in the strategy, the leg 2 price is calculated using the assigned 3M leg trade price minus traded strategy net price.

If the 3M leg is the second leg, the leg 1 price is calculated using the assigned 3M leg price plus the traded strategy net price.

Carry	LFC 3M price	Trade price	Leg 1 price	Leg 2 price
NI Feb23-3M	12849.91	-0.65	12849.26	12849.91
SN 3M-May23	21425.00	-0.10	21425.00	21425.10

2.3.6.2 Averages

Each leg within the Average is allocated the strategy trade price.

Average	LFC price	Trade price	Leg price
AH 2Q23			
Apr23	1904.41	1905.00	1905.00
May23	1904.91		1905.00
Jun23	1905.68		1905.00

2.3.6.3 Carry Averages

The front leg uses the LFC price and the trade price of other average legs is calculated from the leg 1 trade price - traded strategy price (differential).

Carry Average	LFC 3M price	LFC price	Trade price	Leg price
NI 3M-3Q23				
Jul23	1555.00	1555.53	1.65	1553.35
Aug23		1555.83		1553.35
Sep23		1556.13		1553.35

2.3.6.4 Custom Strategies

A price is assigned to each leg in the strategy either the LFC price for futures or OFV for options and the net price for the strategy is calculated according to the definition of the strategy by adding buy legs and subtracting sell legs.

The difference is calculated between the strategy net price and the trade price. The difference is then divided into minimum price movement increments (according to the configured tick size) for the tradable instrument and allocated to each leg starting with the furthest dated leg for futures and for options the furthest dated expiry month and furthest from the money option strike.

If the strategy has ratio legs, for example a Butterfly, the ratio legs will only have one trade price as the difference will only be assigned in ratio increments. For legs that are defined as a buy the difference is added to the LFC/OFV price. For legs that are defined as a sell the difference is subtracted from the LFC/OFV price.

2.3.6.4.1 Examples

For the following examples assume the current trading day is 5 April 2023 and the 3M actual prompt date is 5 July:

Assume the following LFC prices have been provided by the LME Pricing service to LMEselect v10:

Order book	LFC price
M1 (Apr23)	6115
M2 (May 23)	6119
3M (Jul23)	6115
M3 (Jun23)	6122
M4 (Jul 23)	6132

Example 1: Futures Butterfly with ratio leg adjustment

An Apr23-May23-Jun23 Butterfly (buy the near month, sell the next month twice and buy the last month) is created and trades at a price of -2.5.

Each leg is allocated an LFC price as shown in the table which is used in the net price calculation.

Price of first leg – 2X price of second leg + price of third leg = net price

(6115 – (2*6119) + 6122) = -1.0

The difference between the trade price and the net price is calculated:

-2.5 – (-1.0) = -1.5

The difference is divided into minimum price movement increments using the configured tick size for Aluminium futures which is 0.5.

1.5 ÷ 0.5 = 3 which is the number of adjustments to be made

The minimum price movement increments are assigned to each leg starting with the furthest leg:

M3 (Jun23) = 6122 + (-0.5) = 6121.5

M2 (May23) = 6119 – (-0.5) = 6119.5

M2 (May23) = 6119 – (-0.5) = 6119.5

M1 (Apr23) = 6115 (the difference has been allocated and so there is no adjustment to this leg).

Strategy	LFC price	Trade price	Leg price
CA Apr23-May23-Jun23 Butterfly (buy M1, sell 2xM2, buy M3)			
M1 (Apr23)	6115	-2.5	6115
M2 (May23)	6119		6119.5

Strategy	LFC price	Trade price	Leg price
M3 (Jun23)	6122		6121.5

Example 2: Futures Butterfly with insufficient difference for ratio leg adjustment

An Apr23-May23-Jun23 Butterfly is created and trades at a price of -2.0.

Each leg is allocated an LFC price as shown in the table which is used in the net price calculation.

(6115 – (2*6119) + 6122) = -1.0

The difference between the trade price and the net price is calculated:

-2.0 – (-1.0) = -1.0

The difference is divided into minimum price movement increments using the configured tick size for Aluminium futures which is 0.5.

1.0 (* -0.5) = 2

The minimum price movement increments are assigned to each leg starting with the furthest leg:

M3 (Jun23) = 6122 + (-0.5) = 6121.5

M2 (May23) = 6119 (insufficient difference to enable adjustment to be made to the entire ratio therefore no adjustment is made)

M2 (May23) = 6119 – (-0.5) = 6119

M1 (Apr23) = 6115 + (-0.5) = 6114.5.

Strategy	LFC price	Trade price	Leg price
CA Apr23-May23-Jun23 Butterfly (buy M1, sell 2xM2, buy M3)			
M1 (Apr23)	6115	-2.0	6114.5
M2 (May23)	6119		6119
M3 (Jun23)	6122		6121.5

Example 3: Futures Butterfly including a 3M leg

A May23-3M-Jul23 Butterfly is created and trades at a price of 2.0.

Each leg is allocated an LFC price as shown in the table which is used in the net price calculation.

(6119 - (2*6125) + 6132 = 1.0

The difference between the trade price and the net price is calculated:

2.0 - 1.0 = 1

The difference is divided into minimum price movement increments using the configured tick size for Aluminium futures which is 0.5.

1.0 (*0.5) = 2

The minimum price movement increments are assigned to each leg starting with the furthest leg:

M4 (Jul23) = 6132 + 0.5 = 6132.5

3M (Jul23) = 6125 (no adjustments are made the 3M leg)

M2 (May23) = 6119 + 0.5 = 6119.5

Strategy	LFC price	Trade price	Leg price
CA May23-3M-Jul23 Butterfly (buy M2, sell 2x3M, buy M4)			
M2 (May23)	6119	2.0	6119.5
3M (Jul23)	6125		6125
M4 (Jul23)	6132		6132.5

Example 4: Futures Butterfly with variable tick configurations

A Jan-Feb-Mar24 Butterfly is created and trades at a price of 0.67.

Different tick sizes have been configured for the legs and the strategy tick size is set to 0.01.

Each leg is allocated an LFC price which is used in the net price calculation.

*6913.25 - (2*6915) + 6917.5 = 0.75*

The difference between the trade price and the net price is calculated:

0.67 – 0.75 = -0.08

The minimum price movement increments are assigned to each leg starting with the furthest leg resulting in:

M3 (Mar24) = 6917.50 + (-0.02) = 6917.48

M2 (Feb24) = 6915.00 – (-0.02) = 6915.02

M2 (Feb24) = 6915.02 – (-0.02) = 6115.02

M1 (Jan24) = 6913.25 + (-0.02) = 6913.23

Strategy	Tick size	LFC price	Trade price	Leg price
CA Jan24-Feb24-Mar24 Butterfly (buy M1, sell 2xM2, buy M3)				
Jan24	0.25	6913.25	0.67	6913.23
Feb24	0.50	6915		6915.02
Mar24	0.50	6917.5		6917.48

Example 5: Call Spread

The exchange defined strategy type, Call / Put Spread is also priced according to the custom strategy leg price allocation approach.

An option Call Spread – AH Oct23 C1990 C2200 (buy a call, sell a call with a higher strike within the same expiration series) is created and trades at a price of 28.42

LMEselect v10 calculates the strategy net price using the OFV from the LME Pricing service (53.12 − 31.45) = 21.67

LMEselect v10 calculates difference the between the calculated strategy net price and traded net price = 28.42 − 21.67 = 6.75

The difference is divided into minimum price movement increments using the configured tick size for the strategy which is 0.01 = 6.75 (*0.01)

The minimum price movement increments are assigned to each leg starting with the furthest from the ATM strike which is 1900:

Leg 1 (Oct23 C1990) = 53.12 + 3.37 = 56.49

Leg 2 (Oct23 C2200) = 31.45 − 3.38 = 28.07

Strategy	OFV	Trade price	Leg price
Call Spread – AH Oct23 C1990 C2200			
OCT23 C1990	53.12	28.42	56.49
OCT23 C2200	31.45		28.07

2.3.6.5   Delta Hedge Strategies

Order execution in a delta hedge strategy will result in LMEselect v10 assigning leg prices for the option legs as follows:

- *If there is only one option leg in the delta hedge strategy the strategy price is assigned to the option leg.*
- *If there are more than one option leg in the delta hedge strategy, the strategy price is assigned to the option legs in accordance with the custom strategy leg allocation rules, see* Custom Strategies*.*

LMEselect v10 will calculate the futures delta hedge leg(s):

- *The underlying price specified in the Security Definition Request is the trade price assigned to the futures delta hedge leg(s).*
- *LMEselect v10 will assign the futures strategy leg volume using the traded strategy volume and specified delta defined in the Security Definition Request (ie, strategy option volume x delta). Future volume is rounded to the nearest whole lot. Note that if a delta hedge order is executed in multiple clips it is possible for a different delta to be executed resulting from rounding.*

Example: Call Spread versus underlying

A Call Spread versus underlying - AH Oct23 C6000 C6050 (buy a call, sell a call with a higher strike within the same expiration series and sell the underlying) is created with an underlying price of 6000.

Strategy	OFV	Strategy price
Call Spread versus underlying – AH Oct23 C6000 C6050 Oct23 6000		
Oct23 C6000	38	-12

Strategy	OFV	Strategy price
Oct23 C6050	50	

The LFC price of the Oct23 third Wednesday prompt moves up to 6500 and the OFV are adjusted. The order trades 10 lots at a price of -6.

LMEselect v10 uses the current OFV to calculate the strategy price = (38 – 50) = -12

LMEselect v10 calculates difference between OFV strategy price and traded strategy price = -6 – -12 = 6

The difference is allocated to each leg equally:

Leg 1 (Oct23 C6000) = 38 + 3 = 41

Leg 2 (Oct23 C6050) = 50 – 3 = 47

Strategy	OFV	Trade price	Leg price
Call Spread versus underlying – AH Oct23 C6000 C6050 Oct23 6000			
OCT23 C6000	38	-6	41
OCT23 C6050	50		47

The futures leg is assigned the price defined within the Security Definition of 6000.

LMEselect v10 calculates the futures leg volume by applying delta defined in the Security Definition to the traded volume:

10 lots x 0.75 delta = 8 (rounded to nearest)

2.3.7 Implied Trading

An implied order is a synthetic order generated in an order book from two (or more) orders linked via a multi-leg (strategy) order book in the same contract. For example, M1 bid and 3M offer can create an implied bid in the M1-3M Carry. This can add liquidity to less liquid order books by leveraging liquidity in more active order books.

The following implied types are supported:

- Implied In – derived from explicit orders in outright order books into the legs of a strategy (as the example above). See Implied In from Outright Orders.
- Implied Out - derived from explicit orders in strategy order books and an outright order in one of the individual underlying legs. See Implied Out to Outright Orders.

An M1-3M Carry through which an implied order can be created is known as an implied route. The LME's prompt date structure allows for a vast number of Carry combinations therefore the number that make use of implied generation is limited to LME defined routes configured at contract level.

The best implied bid or offer price is calculated using the best explicit prices[2] from the other order books and validated against price bands/limits. Any implied orders either outrights or Carries that fall outside of price

---

[2] Note where implied chaining is enabled implied prices can also be used.

bands/limits will not be created and entered into the order books. It may not be possible to use the exact calculated price as this could either be outside price bands/limits or not an exact multiple of the tick size ie, the implied price is off tick. To ensure that a valid price is generated, the price will be rounded to the nearest valid price for the order book. Implied bids are rounded down to the nearest valid price and implied offers are rounded up to the nearest valid price. Any rounded price is validated against price bands/limits.

If the rounded implied price is executed, the price improvement (the difference between the calculated price and rounded price) is assigned to the LME configured allocation for the contract. This can be *either the aggressing order, resting order or* the strategy order book.

The order receiving the price improvement will also be determined using the timestamps of the orders, see Timestamps. *If the price improvement is configured to be allocated to the aggressing order and that order is an implied, it will be allocated to the youngest parent. If the price improvement is configured to be allocated to the resting order and that order is an implied, it will be allocated to the oldest parent.*

Price improvement allocation according to the price improvement configuration:

Aggressing matching order	*Aggressor*	*Instigator*	Strategy order book
Implied	*Incoming implied order's youngest parent, where outright can be traded at finer tick*	*Oldest parent of respective implied order, where outright can be traded at finer tick.*	Full tick price improvement to the aggressing order, with any finer tick allocated to the strategy order book of respective implied route (youngest parent)

Explicit order quantity is used in implied calculations. *For Iceberg orders, only the visible quantity is applicable ie, the display quantity.* Non-resting orders such as untriggered Stops, *FOK* and IOC orders are excluded from implied generation.

Implied order quantity advertised will be the lowest quantity available from parent orders of implied route(s). An order book can receive volume from the best priced implied order generated per route, providing depth at different price levels. Explicit quantity in any single order book is available to multiple routes (and can be used in multiple implied orders) but can only be traded once.

Order priority is assigned when the implied price is generated. A change to the parent order priority or a change to the parent combinations will be reflected by a change in the implied. An amendment to a parent order can result in multiple implied order updates and priority reassignment. An implied price will be validated against price bands/limits.

As implieds are generated in response to an incoming parent order that rests in the order book they may execute with any orders already resting in the order book. This execution of implied orders upon creation in response to an incoming parent order is known as side effect trading. Where multiple routes exist, implieds will be generated in time to expiry order.

The calculation of an implied order will be triggered by the following events:

1.   Uncrossing, see Sequence of Uncrossing.

2.   The implied order executes, see Order Execution Processing.

3.   When there is a change to a parent order book that would lead to a change in the implied order.

4.   Price bands/limits move such that the:

(a)   Implied price has moved inside price bands/limits and implieds should be generated

(b)   Implied price moves outside price bands/limits and implieds should be removed.

LMEsource will publish implied prices on creation and will identify any trades that result from implied trading.

Note: Implied prices will only be generated in market open and will cleared when the trading schedule transitions to another state or if a trading condition is imposed.

2.3.7.1   Implied In from Outright Orders

An implied order can be created in strategy order books from explicit orders in the outright order books of the legs of the strategy.

An implied can be created in a Carry from two explicit orders in outrights as follows:

2.3.7.1.1 Carry Bid = Leg 1 Bid – Leg 2 Offer

The following orders are submitted in timestamp order:

- (T1) 3M: bid for 6904.00 for 10 lots
- (T2) M4: offer at 6903.50 for 5 lots

An implied in bid is created in 3M-M4 for 5 lots at 0.50, Leg 1 is from the 3M bid and Leg 2 from the M4 offer. This is calculated as:

3M-M4 = 3M bid – M4 offer

6904.00 – 6903.50 = 0.50
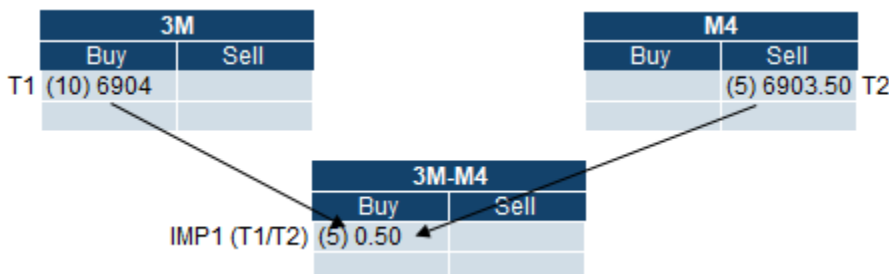
2.3.7.1.2 Carry Offer = Leg 1 Offer – Leg 2 Bid

The following orders are submitted shown with timestamps:

- (T1) 3M: offer at 1798.00 for 3 lots
- (T2) M4: bid for 1799.50 for 8 lots

An implied in offer is created in 3M-M4 for 3 lots at -1.50, Leg 1 is from the 3M offer and Leg 2 from the M4 bid. This is calculated as:

3M-M4 = 3M offer – M4 bid

1798.00 – 1799.50 = -1.50.

3M	
Buy	Sell
	(3) 1798.00 T1

M4	
Buy	Sell
T2 (8) 1799.50	

3M-M4	
Buy	Sell
	(3) -1.50 IMP1 (T1/T2)

2.3.7.2   Implied Out to Outright Orders

An implied order can be created out of strategy order books based on related explicit orders in the strategy and the legs of the strategy.

An implied can be created in an outright from a related order and one of the legs of a Carry as follows:

- Forward Implied Bid = Leg 1 Bid - Carry Offer
- Forward Implied Offer = Leg 1 Offer - Carry Bid
- Backward Implied Bid = Leg 2 Bid + Carry Bid
- Backward Implied Offer = Leg 2 Offer + Carry Offer

A single incoming order may be a parent order in one or more implied out order.

2.3.7.2.1 Forward Implied Bid = Leg 1 Bid – Carry Offer

The following orders are submitted shown with timestamps:

- (T1) 3M: bid for 1475.00 for 4 lots
- (T2) 3M-M4: offer at 1.50 for 7 lots

The implied out bid is created in M4 from the 3M outright bid and the 3M-M4 offer. This is calculated as:

M4 bid = 3M bid – 3M-M4 offer

1475.00 – 1.50 = 1473.50

3M	
Buy	Sell
T1 (4) 1475.00	

M4	
Buy	Sell
IMP1 (T1/T2) (4) 1473.50	

3M-M4	
Buy	Sell
Buy	(7) 1.50 T2

2.3.7.2.2 Forward Implied Offer = Leg 1 Offer – Carry Bid

The following orders are submitted shown with timestamps:

- (T1) 3M: offer at 6903.00 for 7 lots
- (T2) 3M-M4: bid for -1.50 for 2 lots

An implied out offer is created in M4 from the 3M outright offer and the 3M-M4 bid. This is calculated as:

M4 offer = 3M offer – 3M-M4 bid

6903.00 – (-1.50) = 6904.50

2.3.7.2.3 Backward Implied Bid = Leg 2 Bid + Carry Bid

The following orders are submitted shown with timestamps:

- (T1) M4: bid for 1802.00 for 6 lots
- (T2) 3M-M4: bid for 1.50 for 5 lots

An implied out bid is created in 3M from the M4 outright bid and the 3M-M4 bid. This is calculated as:

3M bid = M4 bid + 3M-M4 bid

1802.00 + 1.50 = 1803.50

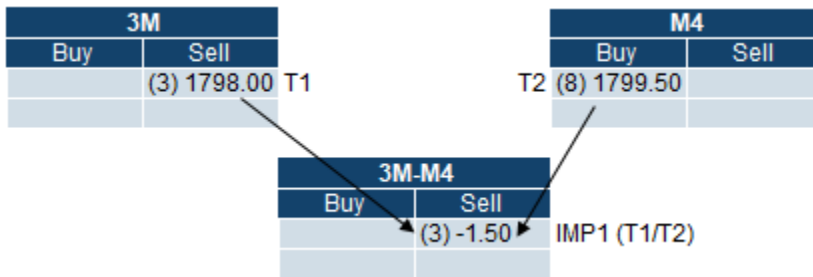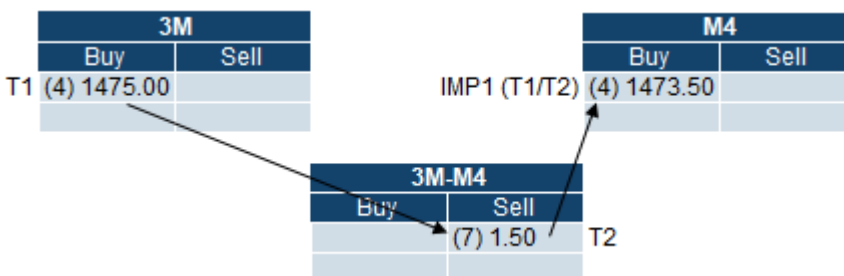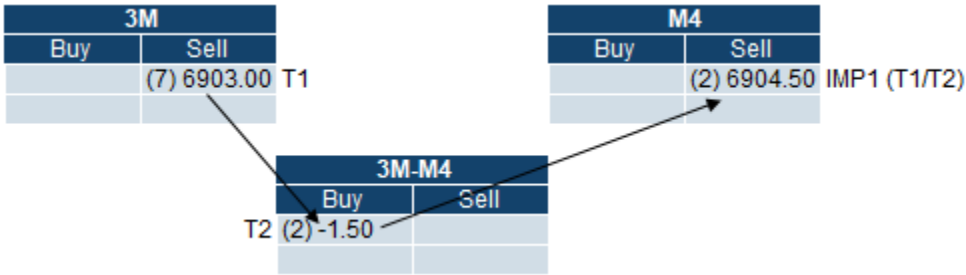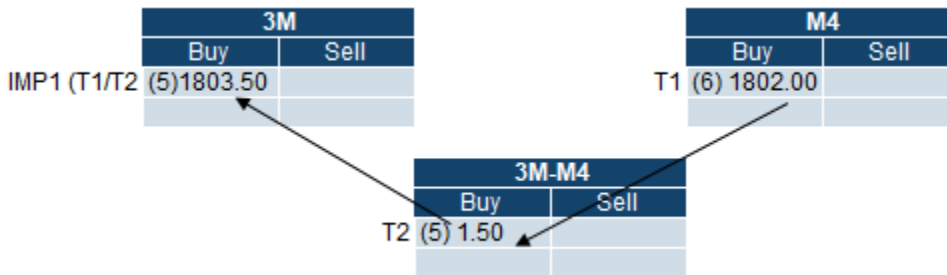### 2.3.7.2.4 Backward Implied Offer = Leg 2 Offer + Carry Offer

The following orders are submitted shown with timestamps:

- (T1) M4: offer at 2936.00 for 13 lots
- (T2) 3M-M4: offer at -2.50 for 8 lots

An implied out offer is created in 3M from the M4 outright offer and the 3M-M4 offer. This is calculated as:

3M offer = M4 offer + 3M-M4 offer

2936.00 + (-2.50) = 2933.50
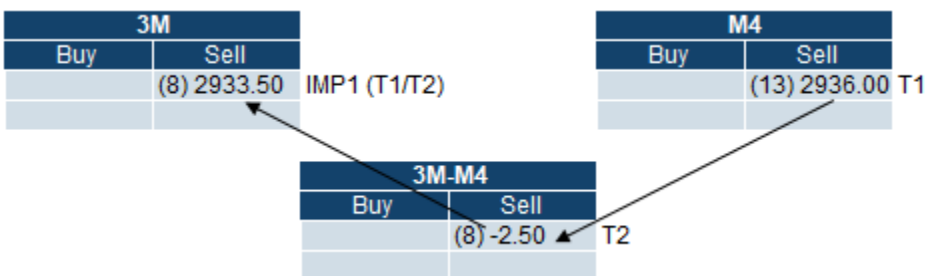
2.3.8 Order Execution Processing

When an order is accepted, it is assessed to determine whether it can be matched with any orders currently resting in the order book or through side effect trading (where the incoming order generates an implied order which can trade in another order book).

An incoming order will then match against crossed order volume according to the following sequence:

1. At the first (best) price level trade all visible volume (explicit, implied *and the open visible quantity of Iceberg orders*) according to the configured trading algorithm (ie, price-time, see [Price-Time](#)).

   (a)   Any residual volume should be allocated to the remaining full order quantity of each Iceberg order in time priority order (ie, oldest first).

   (b)   Trigger any Stop *or OCO* orders. These orders will then be submitted for order execution checking and processing once the incoming order has completed order execution.

2. Move to the next price level:

   (a)   Recalculate implied orders for the next price level including off tick implied level and repeat step 1 for the price level.

   (b)   As the order book sweeps through multiple price levels, repeat this step for each price level until there is no crossed resting volume remaining.

3. If any further residual volume is available in the incoming order, conduct side effect trading (to determine if the incoming order could be a parent of a matched implied in another order book).

4. If any further residual volume is available in the incoming order then this will rest in the order book (according to its time validity condition).

5. Repeat steps 1 to 4 for each triggered Stop order in price-time priority order:

   (a)   For Stop bids the lowest stop price level are processed first, for Stop offers the highest stop price level are processed first.

   (b)   If both bids and offers are triggered they are processed in a pure round robin sequence (ie, alternately processing a stop order from each side of market):

      (i)   Starting with bids if the trade is a rising price

      (ii) Starting with offers if the trade is a falling price.

At any point during order execution processing the incoming order could be subject to Self Execution Prevention (SEP), see [Self-Execution Prevention](#). If the SEP protection response is the cancel the incoming order then the order is cancelled and no further order execution processing is conducted.

Note if MMP is breached at any point during steps 1 to 3 then order execution processing will continue until all order volume has been executed. The protection response (to cancel residual volume and reject further order submissions) will only be invoked at the end of step 3.

The trade price assigned to a matched trade is the resting order price. The trade volume is assigned according to matching algorithm. For strategies the volume is assigned to the legs according to the leg ratio.

2.3.8.1 Implied Order Processing Examples

Example 1: Implied orders trade through depth

The following example illustrates that implied orders are recalculated as an incoming order executes through multiple price levels.

Assume the following orders shown with timestamps are in the market:

M1			
	Buy	**Sell**	
T5	(10) 5765.00	40 at 5763.00	T10
IMP1 (T6/T8)	(10) 5765.00		
IMP2 (T7/T8)	(10) 5764.50		
T3	(10) 5764.00	(10) 5763.00 Stop	T4
IMP3 (T7/T9)	(10) 5763.50		
T2	(10) 5763.00		
T1	(10) 5762.00		

3M		
	Buy	**Sell**
T6	(10) 5776.00	
T7	(20) 5775.50	

M1-3M		
	Buy	**Sell**
T8	(20) -11.00	
T9	(10) -12.00	
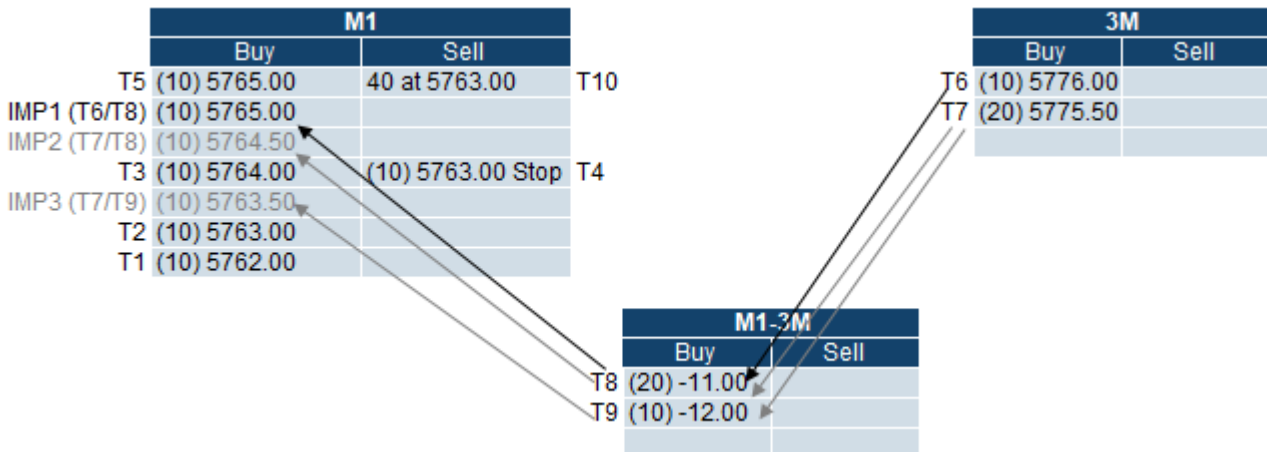
1. A Limit offer T10 for 40 lots is submitted at 5763 into the M1 order book.

2. The following order execution occurs:

    (a) 20 lots trade at 5765, 10 against the explicit T5 and 10 against the implied T6/T8.

    (b) Implieds are recalculated for the next price level = 5764.50 M1 T7 and -11 T8 M1-3M generates an M1 implied out T7/T8 of 5764.5 which is the next best prices and trades.

    (c) Implieds are recalculated for the next price level = 5763.5 which is not the next best price so the 5764.0 T3 explicit order trades.

3. The Stop order is not triggered. Note that if implied orders had not been calculated at each price level the Stop order would have been triggered and traded.

4. No side effect trading is required.

5. Implied orders are recalculated and published with the resulting order book as follows:

M1			
	Buy	**Sell**	
IMP3 (T7/T9)	(10) 5763.50		
T2	(10) 5763.00	(10) 5763.00 Stop	
T1	(10) 5762.00		

3M		
	Buy	**Sell**
T7	(10) 5775.50	

M1-3M		
	Buy	**Sell**
T9	(10) -12.00	
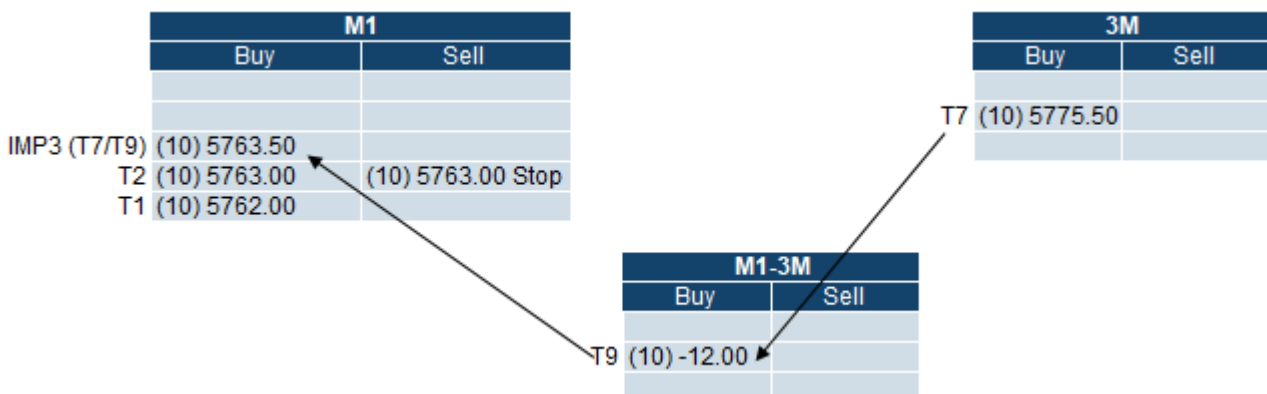
Example 2: Implied pure price-time

The following example illustrates that implied orders execute according to pure price-time with the timestamp of the implied assigned at the time of its generation, including when an implied is calculated as an incoming order executes through multiple price levels.

Assume the following orders shown with timestamps are in the market:

1. A Limit offer T10 for 25 lots is submitted at 5763 into the M1 order book.

2. The following order execution occurs at the best price in time priority order:

    (a) 10 lots trade against the 5765 T1 explicit order

    (b) 10 lots trade against the 5765 T4/T3 implied order (T3 M1-3M and T4 3M parent orders)

    (c) 5 lots trade against the 5765 T8 explicit order

3. The Stop order is not triggered

4. No side effect trading is required, with the resulting order book as follows:
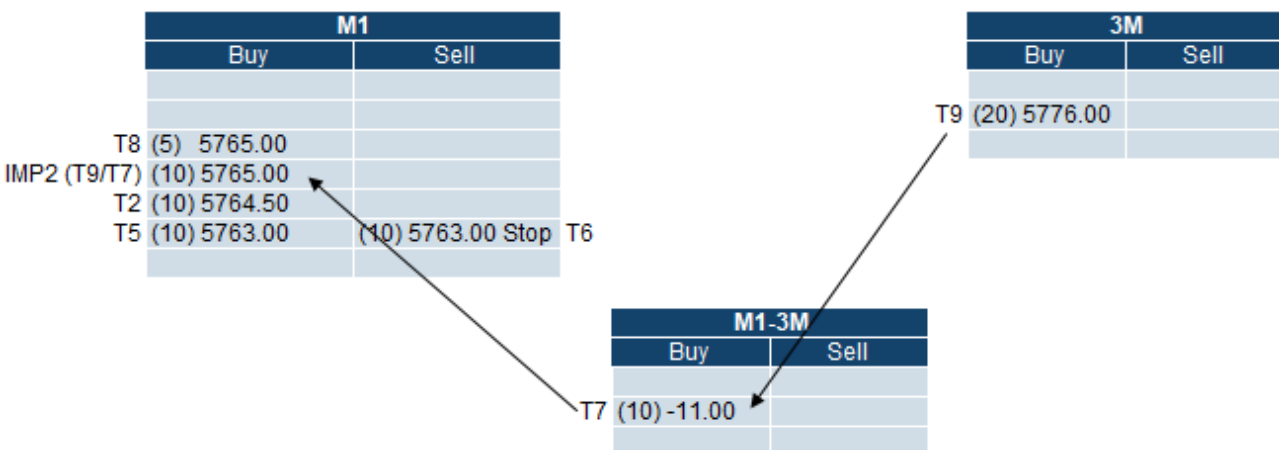
Example 3: Implied in depth with finer tick configuration

The following example illustrates that an implied order that has been rounded to the nearest valid tick price because it was calculated at a finer tick will retain price priority over all orders at the valid tick price and trade in priority to those orders even if they have time priority. This occurs when the implied is at best price or when the implied is calculated when an incoming order executes through multiple price levels.

Assume the following orders shown with timestamps are in the market. The outright order books are configured with a tick price interval of 0.50 and Carry order books are configured with a tick price interval of 0.01.
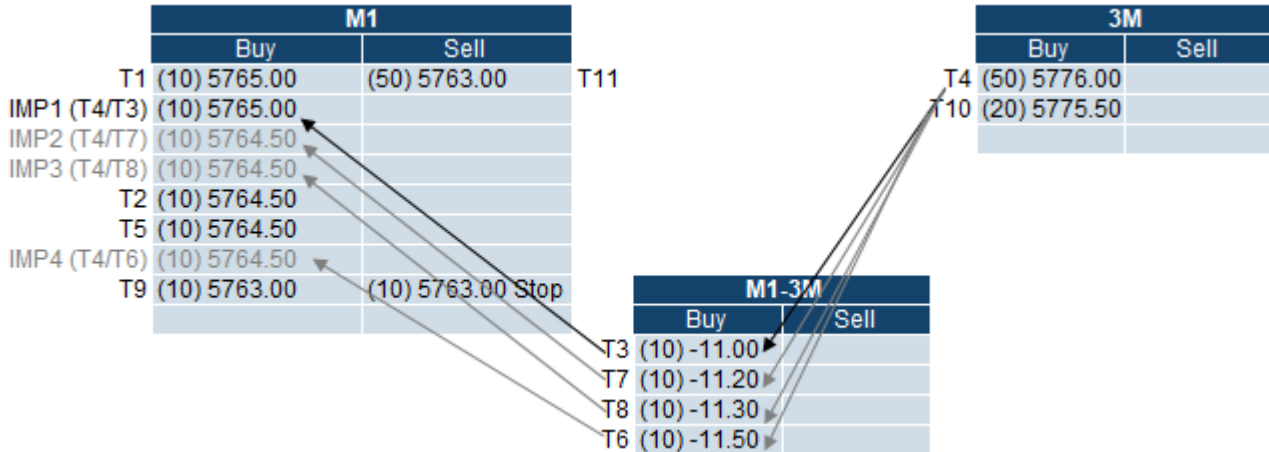
1. A Limit offer T11 for 50 lots is submitted at 5763 into the M1 order book.

2. The following order execution occurs:

   (a) 20 lots trade at 5765, 10 lots against the explicit T1 and 10 lots against the implied T4/T3

   (b) Implieds are recalculated for the next price level:

      (i) T4 and T7 generates an implied out price of 5764.8 (best price) which is an invalid tick for the outright order book. This calculated implied price is rounded down to 5764.5 (published price). The implied executes, it does not have time priority over the explicit orders (T2 and T5) but has price priority (which is based on the calculated not published price).

      (ii) T4 and T8 generates an implied out price of 5764.7 (best price) which is an invalid tick for the outright order book. This calculated price is rounded down to 5764.5 (published price). The implied executes, it does not have time priority over the explicit orders (T2 and T5) but has price priority (which is based on the calculated not published price).

      (iii) T4 and T6 generates an implied out price of 5764.5. The remaining 10 lots executes against the explicit order T2 as it has time priority over the implied T4/T6 and other explicit order T5.

   Note: Price improvements that are off tick will be allocated to the strategy.

3. The Stop order is not triggered

4. No side effect trading is required.

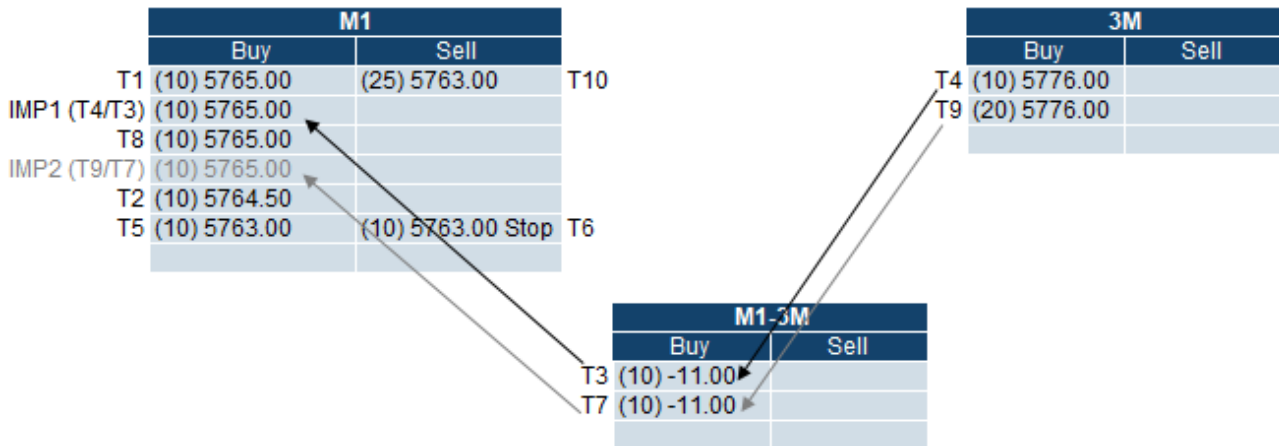5. The implied order is recalculated and published with the resulting order book as follows:
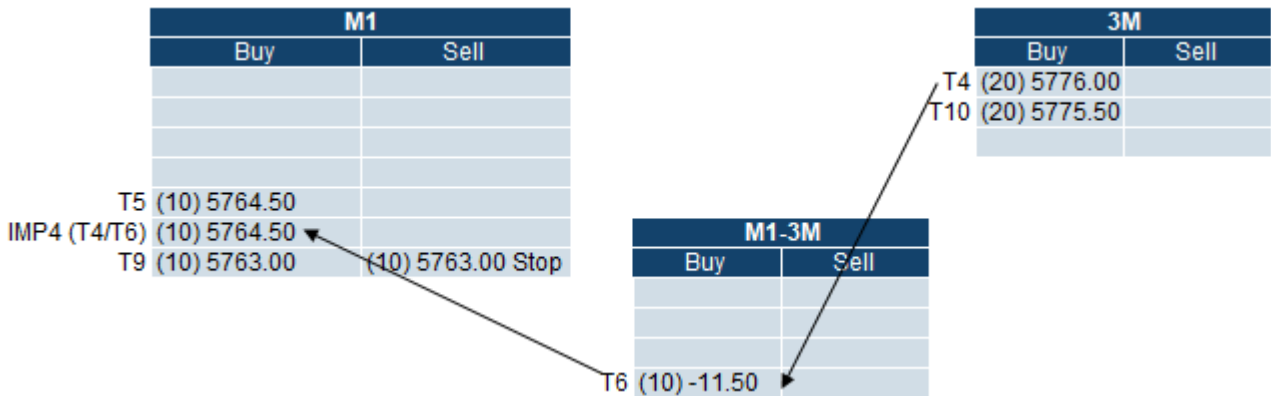
Example 4: Implied created from best explicit price

The following example illustrates that an implied can be created from a best explicit price which does not have priority.
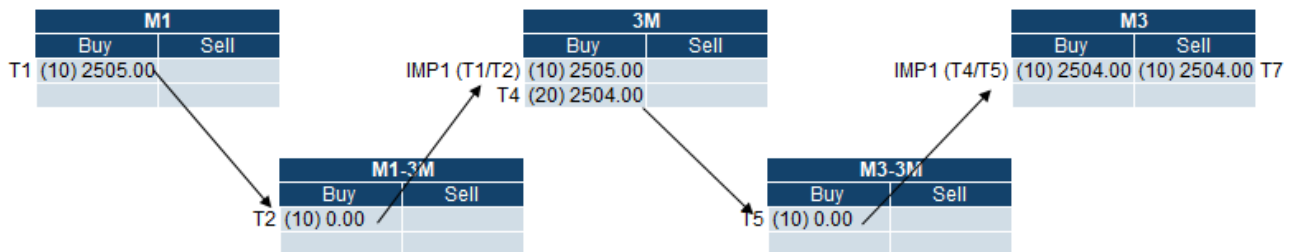
1. A Limit bid T1 of 10 lots is submitted at 2505 into the M1 order book.

2. T1 and T2 generates an implied out price of 2505 (best price and priority) in 3M.

3. T4 is entered which is the best priced explicit.

4. T5 is entered and together with T4 generate an implied out in M3 as T4 is the best priced explicit.

5. Incoming order T7 trades with the implied order T4/T5, T4 explicit will trade ahead of the better priced implied T1/T2.
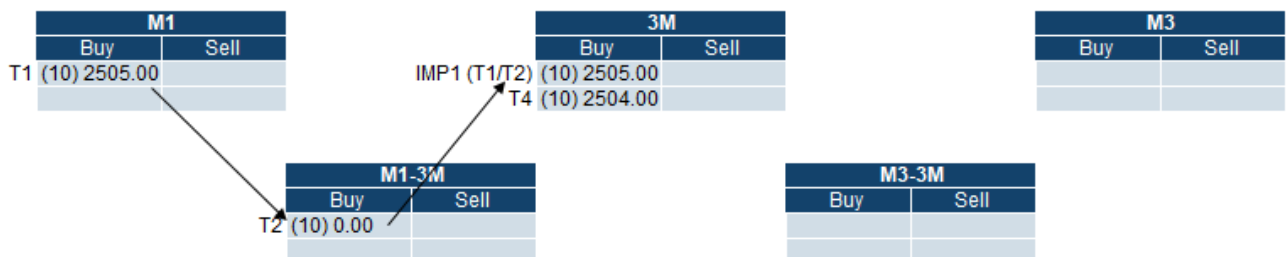
2.3.8.2   Order Book Sweep Examples

Example 1: An incoming order trades against resting explicit and implied orders in depth leaving residual volume

Assume the following orders shown with timestamps are in the market:

M1	
Buy	Sell
T1 (10) 2507	

3M	
Buy	Sell
T3 (5) 2509	
T4 (3) 2508	
IMP1 (T1/T2) (10) 2507	(20) 2507 T5

M1-3M	
Buy	Sell
	(10) 0.00 T2
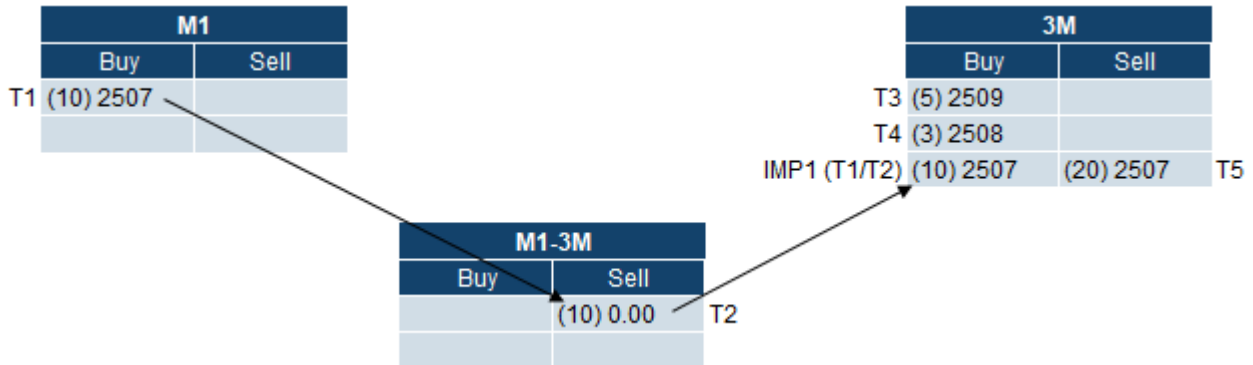
1.   A Limit offer T5 for 20 lots is submitted at 2507 into the M2 order book

2.   The following order execution occurs:

    (a)   5 lots trade against the 2509 T3 explicit order

    (b)   3 lots trade against the 2508 T4 explicit order

    (c)   10 lots trade against the 2507 TI/T2 implied order

    (d)   10 lots trade against the 2507 T1 explicit order

    (e)   10 lots trade against the 0 .00 T2 explicit order

3.   The residual volume in T5 rests in the order book.

M1	
Buy	Sell

3M	
Buy	Sell
	(2) 2507 T5

M1-3M	
Buy	Sell

Example 2: An incoming order trades and triggers a Stop

Assume the following orders shown with timestamps are in the market:

M1		
Buy	**Sell**	
T1 (10) 2510		
T2 (9) 2509	(20) 2508	T10
T3 (8) 2508	(55) 2500 TP2508	T0 Stop
T4 (7) 2507		
T5 (6) 2506		
T6 (5) 2505		
T7 (10) 2504		
T8 (10) 2502		
T9 (10) 2500		

1. A Limit offer T10 for 20 lots is submitted at 2508 into the order book.

2. The following order execution occurs:

    (a) 10 lots trade against the 2510 T1 explicit order

    (b) 9 lots trade against the 2509 T2 explicit order

    (c) 1 lots trade against the 2508 T3 explicit order which triggers the T0 Stop order

3. The following order execution occurs:

    (a) 7 lots trade against the 2508 T3 explicit order

    (b) 7 lots trade against the 2507 T4 explicit order

    (c) 6 lots trade against the 2506 T5 explicit order

    (d) 5 lots trade against the 2505 T6 explicit order

    (e) 10 lots trade against the 2504 T7 explicit order

    (f) 10 lots trade against the 2502 T8 explicit order

    (g) 10 lots trade against the 2500 T9 explicit order.

Example 3: An incoming order trades against resting implieds at best price and in depth with finer tick configuration

The outright order books are configured with a tick price interval of 0.50 and Carry order books are configured with a tick price interval of 0.01.

Assume the following orders shown with timestamps are in the market:
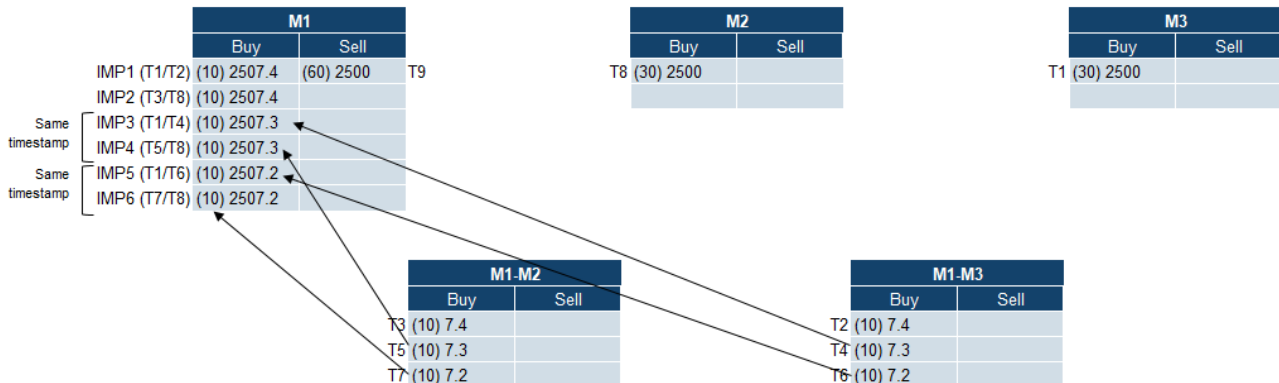
1. A Limit offer T9 for 60 lots is submitted at 2500 into the M1 order book.

2. The following order execution occurs:

    (a) 10 lots trade against the 2500 T1 explicit order

    (b) 10 lots trade against the 7.0 T2 explicit order

    (c) 10 lots trade against the 2500 T8 explicit order

    (d) 10 lots trade against the 7.0 T3 explicit order

    (e) 10 lots trade against the 2500 T1 explicit order

    (f) 10 lots trade against the 7.0 T4 explicit order

    (g) 10 lots trade against the 2500 T8 explicit order

    (h) 10 lots trade against the 7.0 T5 explicit order

    (i) 10 lots trade against the 2500 T1 explicit order

    (j) 10 lots trade against the 7.0 T6 explicit order

    (k) 10 lots trade against the 2500 T8 explicit order

    (l) 10 lots trade against the 7.0 T7 explicit order

3. Price improvements are allocated to the Carries, each trading at 7.0 and to T9 trading at 2507.

2.3.9 Self-Execution Prevention (SEP)

A member can guard against traders in their organisation executing orders with each other.

A member can use SEP functionality without configuring a SEP handling action in which case the LME configured response type would be triggered to cancel the incoming order or a member can configure SEP identifiers and specify the action to be taken if two orders with an identical SEP ID could execute. A member's configuration will be effective from the next trading day.

The availability of SEP functionality will be determined by the LME. If an order is submitted with a SEP identifier where SEP is not configured the order will be rejected.

A SEP ID can be specified on order or mass quote submissions. If orders and/or quotes with an identical SEP ID can be matched the configured SEP handling response is triggered to either cancel the incoming or resting order or both (incoming and resting).

Mass quote validation will reject a quote pair if the quotes within it can cross. SEP validation will cancel quotes that can cross in different quote pairs, see SEP Processing.

*SEP will not be applied to trades matched during uncrossing or through implied orders**. Stop orders submitted with a SEP ID will not be validated for SEP until the order is triggered.***

Iceberg and Fill or Kill orders specified with a SEP ID will be rejected.

2.3.9.1   SEP Processing

Example 1: SEP with a strategy order

A trader submits a M1-3M Carry bid for 0.5 for 10 lots with the SEP ID populated. An offer is submitted in M1 at 1500 for 10 lots, the order has an identical SEP ID. The order creates an implied out offer in 3M at 14.50 for 10 lots. The SEP handling response is not triggered as the system generated implied order will not contain a SEP ID. A bid submitted with the same SEP ID in 3M at 14.50 for 10 lots will match with the implied offer and trade.

Order book	Bid	Offer
M1-3M	0.5 (10) SEP	
M1		1500 (10)
3M		14.50 (10) implied

Example 2: SEP with residual volume

A trader submits a bid for 2000 for 500 lots with the SEP ID populated.

Bid	Offer
	1500 (120)
	1900 (120)
	1950 (50)
2000 (500) SEP	2000 (30)
	2000 (90) SEP
	2000 (200)

The order trades with the following resting offers:

- *120 lots at 1500*

- *120 lots at 1900*
- *50 lots at 1950*
- *30 lots at 2000*

The incoming order attempts to trade with the resting offer at 2000 for 90 lots however the offer has an identical SEP ID. The SEP handling response is triggered cancelling the resting offer. The originating trader of the resting order is notified that their order has been cancelled due to SEP.

The residual volume in the bid trades out against another resting offer for 200 lots at 2000.

Example 3: SEP with an order and mass quote

The following orders are submitted with the SEP ID populated and rest in the order book:

- *Bid for 2000 for 500 lots*
- *Offer at 2050 for 100 lots.*

A trader submits the following quote pairs in a mass quote with the SEP ID populated:

- *Quote pair 1: bid for 1990 for 20 lots and offer at 1995 for 30 lots*
- *Quote pair 2: bid for 2100 for 40 lots and offer at 2200 for 50 lots.*

The SEP ID is set at mass quote level and encompasses all the quotes.

Bid	Offer
1990 (20) SEP	*1995 (30) SEP*
2000 (500) SEP	*2050(100) SEP*
2100 (40) SEP	*2200 (50) SEP*

The incoming offer at 1995 for 30 in quote pair 1 can potentially trade out against the resting bid at 2000 but both orders have an identical SEP ID. This triggers the SEP handling response to cancel the incoming order. The quote pair 1 offer is cancelled. The incoming bid for 2100 for 40 lots in quote pair 2 can also potentially trade out against the resting offer at 2050 and it is therefore cancelled.

Example 4: SEP within a mass quote

A trader submits the following quote pairs in a mass quote with the SEP ID populated:

- *Quote pair 1: bid for 1990 for 20 lots and offer at 1995 for 30 lots*
- *Quote pair 2: bid for 1980 for 19 lots and offer at 1985 for 20 lots.*

Bid	Offer
1980 (19) SEP	*1985 (20) SEP*
1990 (20) SEP	*1995 (30) SEP*

The above quote pairs are for the same tradable instrument and pass mass quote entry validation as they do not cross within a quote pair. The quotes in different quote entry pairs can cross with each other (bid for 1990 for 20 lots in quote pair 1 can match with the offer at 1985 for 20 lots in quote pair 2). If no resting orders can be matched with the quote entries then the SEP handling response will be triggered when quote pair 2 is

accepted. Quote pair 2 is treated as an incoming order and the crossed quotes are cancelled according to the configured handling response. The trader is notified that the quote(s) have been cancelled due to SEP.

Example 5: SEP with an amended mass quote

The following orders are submitted with the SEP ID populated and rest in the order book:

- *Bid for 2000 for 500 lots*
- *Offer at 2050 for 100 lots.*

A trader submits the following quote pair in a mass quote with the SEP ID populated:

- *Quote pair 1: Bid for 1990 for 20 lots and offer at 2100 for 30 lots*

Bid	Offer
1990 (20) SEP	2050 (100) SEP
2000 (500) SEP	2100 (30) SEP

The trader submits a mass quote amendment to the price and quantity of both quotes as follows:

- *Quote pair 1: Bid for 1992 for 25 lots and offer at 1995 for 35 lots*

Bid	Offer
1992 (25) SEP	1995 (35) SEP
2000 (500) SEP	2050 (100) SEP

The incoming bid for 1992 for 25 lots replaces the existing bid at 1990 for 20 lots. The incoming offer at 1995 for 35 replaces the 2100 offer for 30 lots. The amended offer in quote pair 1 can potentially trade out against the resting bid at 2000 but as both orders have an identical SEP ID this triggers the SEP handling response to cancel the incoming offer.

3   Risk Management

3.1   Market Maker Protection Configuration

The LME will configure the availability of MMP functionality at contract level eg, Aluminium option and specify a minimum permitted MMP threshold per protection type for each product and contract type.

A member risk manager will use the risk management interface to manage the configuration of MMP parameters for each permissioned trading user. The following protection types are available to be configured which are applicable at contract level:

- *Cumulative percent over time*
- *Volume over time*
- *Number of option tradable instruments traded over time.*

One or more protection types can be specified for each permissioned user in a contract.

For each permissioned trading user, the member risk manager will specify a protection type and protection limit measured over a configured time period which is defined in seconds. This time frame defines the length of the rolling time interval for MMP recalculation which is used to determine if the quantity limit has been reached.

The LME will define a minimum MMP threshold for each protection type in each contract. The threshold only relates to the protection limit and not the timeframe. The protection limit set must be equal to or greater than the LME defined minimum threshold against which protection types are validated. A protection limit set below the minimum threshold will be rejected. If a change is made by the LME to the minimum threshold such that a member risk manager configured MMP limit is below that minimum it will be adjusted accordingly. A member risk manager will be notified if their MMP configuration has been updated as a result of a change to the minimum threshold.

Any changes a member risk manager makes to MMP parameters will take effect immediately and reset the MMP timeframe.

3.2   Pre Trade Risk Management (PTRM)

MiFID II regulations mandate the use of Pre Trade Risk Management to protect against over exposure.

PTRM limit utilisation against risk limits will be calculated by LMEselect v10. Every order submitted will be validated against all applicable risk limits and will be rejected if limits are breached. Limit utilisation will be recalculated in response to every order amendment, cancellation and fill.

3.2.1   LME and Member Configuration

The following diagram shows the participant hierarchy at which limits can be set. Limits are set by the LME and member risk managers. The LME will set limits at member level. A General Clearing Member (GCM) will set member level limits for its Non Clearing Members (NCM). NCM utilisation will contribute to Exchange set limits on the GCM and the limits that the GCM has set on themselves as a firm.

All members will set limits at both member and risk group levels within their own firm. The most stringent limit value for each limit type will apply (either the member limit or the LME limit). **If a limit value is not specified then a default zero limit will apply and orders will be rejected.**
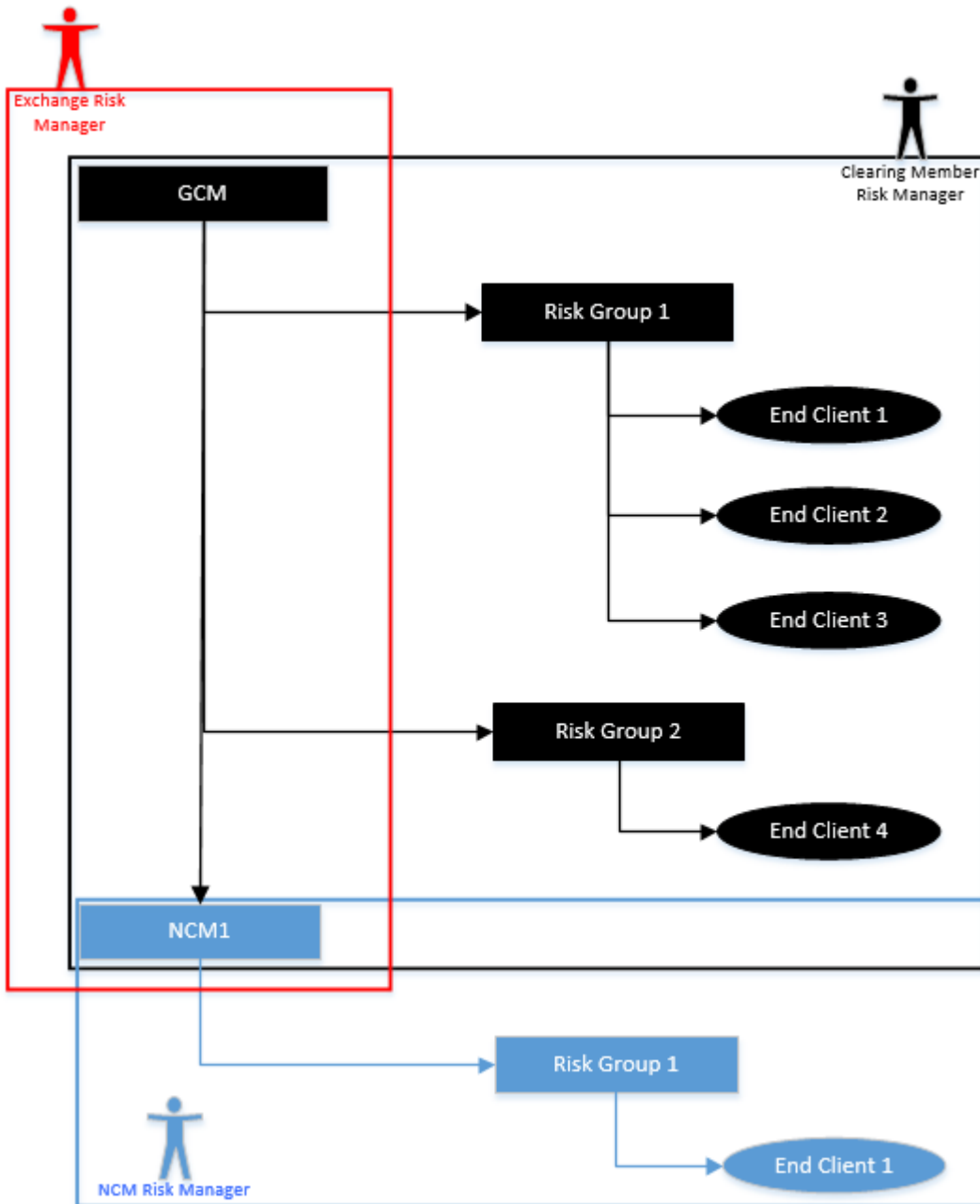
A member will manage their limits using risk groups. The member will allocate limits to each risk group and assign end clients to each risk group. Each member will have a default risk group with a zero limit which means that any end client in this group will have their orders rejected.

End clients will be added and assigned to risk groups. End clients cannot be allocated to more than one group. Once assigned to a risk group, an end client will be immediately subject to the preconfigured limits.

A member risk manager can manage risk groups and end clients during the trading day. The following actions which could affect utilisation will only take effect on the next trading day:

- Move an end client from a non-default risk group to any other risk group
- Delete an end client
- Delete a risk group.

3.2.2 Threshold Alerts and Limit Breaches

The LME will set alerting thresholds to warn member and LME risk managers when the limit utilisation reaches alert thresholds and notify of limit breaches. Limits cannot technically be breached as the order that will breach the limit will be rejected however a limit is deemed to be breached when the limit utilisation is greater than the limit value. Limit utilisation that is equal to the limit value will be accepted.

Threshold alerts and breach notifications will be reported via the risk management interface. Per Order Quantity and Per Order Notional Value limit types will only report breaches.

Alert threshold levels are based on a percentage of utilisation of the limit value set for each limit, for example:

- Warning Amber 75% and above
- Warning Red 90% or above
- Warning Limit Reached at 100%.

The notification will contain both the percentage utilisation and the upper limit threshold value.

Alert threshold and limit breaches on a GCM at member level which as a consequence can affect an NCM clearing through the GCM are reported to both GCM and NCM risk managers.

A member risk manager can request their limit utilisation against risk limits however usage of this request will be throttled.

Limit utilisation is reset to zero daily and following site failover.

3.2.3 Limit Types

The limit types that are available to be set by members are defined by the LME along with the level in the product hierarchy to which they apply, see Utilisation Pools. Some limit types will not be applicable at certain levels in the product hierarchy. For example, Gross Long Quantity and Gross Short Quantity will not be applicable to Carries and Tom-Next.

3.2.3.1 Per Order Quantity

Risk check to prevent inadvertent entry of large order quantity.

Example: Per Order Quantity limit for Nickel future outright

The LME has set more stringent limits for the limit type than the member.

- LME limit set to 2,000 lots

Each order is assessed against the most stringent limit on an order by order basis and only rejected when the quantity limit is breached by a single order.

The following orders are submitted:

Order	Order book	Bid quantity	Offer quantity	PTRM position
1	May23		1,000	Order accepted.
2	May23	1,500		Order accepted.
3	3M		2,000	Order accepted, order quantity equal to LME 2,000 lot limit.

Order	Order book	Bid quantity	Offer quantity	PTRM position
4	3M	2,100		Order rejected – LME limit breach.

3.2.3.2 Per Order Notional Value

Risk check to prevent the entry of an order that exceeds the notional value limit. The value of the order is calculated as the product of the order quantity, lot size and order price.

The order price used in the calculation is determined by order type, see Order Handling. The calculation takes into account variances presented by strategies as detailed in Strategy Handling.

Example: Per Order Quantity Notional Value limits at Nickel future outright and Nickel future Carry level

The member limit for the Nickel future outright is more stringent than the LME limit whereas for the Nickel future Carry, the LME limit is more stringent than the member limit.

Nickel future outright:

- Member limit set to $150,000,000

Nickel future Carry:

- LME limit set to $70,000,000

Each order value is assessed against the most stringent limit on an order by order basis and only rejected when the limit utilisation is breached by a single order.

The following order values (order quantity x lot size x order price) are submitted by a trader:

Order	Order book	Bid value	Offer value	PTRM position
1	3M	$22,000,000		Order accepted.
2	3M		$150,000,000	Order accepted, notional value equal to member limit for futures outrights - no notification sent. Notification is only sent if the limit is breached, not if it is reached.
3	May23	$90,000,000		Order accepted.
4	Cash-3M		$71,000,000	Order rejected - LME limit breach (Carry).

3.2.3.3 Gross Long Quantity

Risk check on accumulated gross long quantity which is calculated as the sum of long (bid) orders and (buy) trades.

For options, all orders and trades that are buying calls and selling puts will be considered as long (buy) orders and trades, see Contract Handling.

Example: Gross Long Quantity limit at Nickel future outright level

The member limit for the Nickel future is more stringent than the LME limit.

Nickel future outright:

- Member limit set to 90,000 lots

The following transactions occur for a trader:

Event	Order book	Bid quantity	Offer quantity	Traded volume		Accumulated gross limit utilisation	PTRM position
				Bid	Offer		
1	Jun24	15,000				15,000	Order accepted.
2	May23	10,000				25,000	Order accepted and increases utilisation.
3	Jun23	45,000				70,000	Order accepted. Limit utilisation increases to 77% of the member limit for Nickel future outrights and triggers a threshold breach warning.
4	Jul23		45,000			70,000	Order accepted. Utilisation remains unchanged as offers are not included in the Gross Long Quantity limit calculation.
5	Aug23	15,000				85,000	Order accepted. Limit utilisation increases to 90% of the member limit for Nickel future outrights and triggers a threshold breach warning.
6	Jun24			15,000		85,000	Order event 1 traded out, gross utilisation unchanged. Trader remains within the member limit for Nickel future outrights.

3.2.3.4 Gross Short Quantity

Risk check on accumulated gross short quantity which is calculated as the sum of short (offer) orders and (sell) trades.

For options, all orders and trades that are selling calls and buying puts will be considered as short (sell) orders and trades, see Contract Handling.

Example: Gross Short Quantity limit at Nickel future outright level

The member has set more stringent limits for the limit type than the LME.

- Member limit set to 145,000 lots

The following transactions occur for a trader:

Event	Order book	Bid quantity	Offer quantity	Traded volume		Accumulated gross limit utilisation	PTRM position
				Bid	**Offer**		
1	Jun24		30,000			30,000	Order accepted.
2	Jun24		25,000		5,000	30,000	Event 1 partially trades 5,000 lots leaving 25,000 lots residual. Gross utilisation unchanged.
3	May24		35,000			65,000	Order accepted and contributes to utilisation.
4	Jul24		25,000			90,000	Order accepted which further increases utilisation.
5	Jun24		25,500			115,500	Order accepted. Limit utilisation increases to 79% of the member limit for Nickel future outrights and triggers a threshold breach warning.
6	3M		50,000			165,500	Order rejected – member limit breach. The trader can submit further orders up to the limit value of 145,000 lots.
7	Mar24	30,000				165,500	Order accepted. Utilisation remains unchanged as bid quantity is not included in the Gross Short Quantity limit calculation.

3.2.3.5 Net Short Quantity

Risk check on accumulated net short quantity which is calculated as the sum of short (offer) orders and sell trades minus buy trades.

For options, all orders and trades that are buying calls and selling puts will be considered as long (buy) orders and trades. Similarly all orders and trades that are selling calls and buying puts will be considered as short (sell) orders and trades, see Contract Handling.

Example: Net Short Quantity limit at Nickel future outright level

The LME has set more stringent limits for the limit type than the member.

- LME limit set to 175,000 lots

The following transactions occur for a trader:

Event	Order book	Bid quantity	Offer quantity	Traded volume		Accumulated net limit utilisation	PTRM position
				Bid	Offer		
1	Jul23	32,500				0	Order accepted. Note bid quantity is not included in Net Short Quantity limit calculation.
2	Cash		40,000			40,000	Order accepted.
3	Jun23		39,500			79,500	Order accepted and increases utilisation.
4	Cash				40,000	79,500	Event 2 traded out, net utilisation unchanged.
5	Jul23			32,500		47,000	Event 1 traded out, net utilisation reduced.
6	Nov23		85,000			132,000	Order accepted. Limit utilisation increases to 75% of the LME limit for Nickel future outrights and triggers a threshold breach warning.
7	3M		35,000			167,000	Order accepted. Limit utilisation increases to 95% and triggers a threshold breach warning.
8	Jun24		5,000			172,000	Order accepted. Limit utilisation increases to 98% and triggers a threshold breach warning.

3.2.3.6 Net Long Quantity

Risk check on accumulated net long quantity which is calculated as the sum of long (bid) orders and buy trades minus sum of sell trades.

For options, all orders and trades that are buying calls and selling puts will be considered as long (buy) orders and trades. Similarly, all orders and trades that are selling calls and buying puts will be considered as short (sell) orders and trades, see Contract Handling.

Example: Net Long Quantity limit at Nickel future outright level

The member has set more stringent limits for the Nickel future than the LME.

Nickel future outright:

- Member limit set to 130,000 lots

The following transactions occur for a trader:

Event	Order book	Bid quantity	Offer quantity	Traded volume		Accumulated net limit utilisation	PTRM position
				Bid	Offer		
1	3M		30,000			0	Order accepted. Note offer quantity is not included in Net Long Quantity limit calculation.
2	Jun23	20,000				20,000	Order accepted.
3	Jul23	22,500				42,500	Order accepted and increases utilisation.
4	Aug23	15,500				58,000	Order accepted and contributes to utilisation.
5	3M				30,000	28,000	Event 1 traded out, net utilisation reduced.
6	Cash	15,000				43,000	Order accepted and increases utilisation.
7	Cash			15,000		43,000	Event 6 traded out, net utilisation unchanged.

The trader remains within the member limit for the Nickel future outright.

3.2.4 Utilisation Pools

Limits can be set at contract type level or below in the product hierarchy:
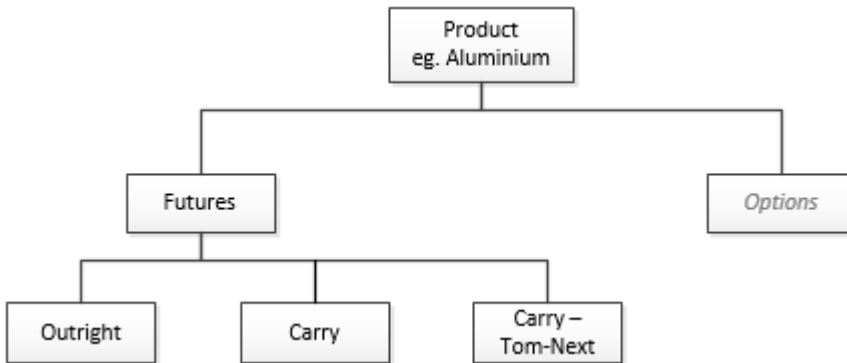
Limits set at contract type level will also encompass lower levels.

Average futures and custom strategies will be included in the utilisation for outrights.

TAPOs will contribute to the options pool.

Delta hedge future legs executed as part of delta hedge strategy will be treated as if it were an option and applied to the option utilisation pool.

Individual limits set at Carry and Tom-Next Carry level will have separate utilisation pools. A limit set just at Carry level will include Tom-Next utilisation in the Carry utilisation calculation.

Example: Gross Long Quantity outright and Carry pools

The LME has set more stringent limits than the member.

Nickel future outrights:

- LME limit set to 1,500 lots

Nickel future Carry:

- LME limit set to 1,500 lots

The following transactions occur for Trader A:

Event	Order book	Bid quantity	Offer quantity	Traded volume		Limit utilisation		PTRM position
				Bid	Offer	Outright	Carry	
1	3M	350				350		Order accepted and is counted in outright utilisation.
2	Jun23	200				550		Order accepted and increases outright utilisation.
3	Cash	550				1100		Order accepted and contributes to outright utilisation.

Event	Order book	Bid quantity	Offer quantity	Traded volume		Limit utilisation		PTRM position
				Bid	**Offer**	**Outright**	**Carry**	
4	Cash	250		300		1100		Event 3 partially trades 300 lots leaving 250 lots residual. Outright utilisation unchanged.
5	Sep23-Dec23	35					35	Order accepted and is counted in Carry utilisation.
6	Jul23	500				1600		Order rejected – LME limit breach (outright).

3.2.5 Utilisation Calculation Principles

3.2.5.1 Contract Handling

For gross and net limit types, the utilisation calculation for options takes account of the direction of the position as follows:

- *Buying a call counts as being long*
- *Buying a put counts as being short*
- *Selling a call counts as being short*
- *Selling a put counts as being long.*

For the notional value limit type, the utilisation calculation uses the strike price.

3.2.5.1.1 PTRM Multiplier

LMEselect v10 uses a PTRM multiplier in the utilisation calculation where individual contracts have different lot sizes to make them equate to each other.

Example: Per Order Quantity limits at LME Aluminium Future Mini and LME Aluminium Future outright level

The lot size for the LME Aluminium Future Mini (MA) contract is 5 tonnes. Instruments belonging to this contract will have a PTRM multiplier of 0.2 as 5 tonnes is one fifth of the size of LME Aluminium Future (AH) which has a lot size of 25 tonnes and therefore has a multiplier of 1.

The Member has set more stringent limits for the limit type than the Exchange.

- Member limit set to 15,000 lots

The following orders are submitted by a trader:

Order	Order book	Bid	Offer	Limit utilisation	PTRM position
1	AH May23	9,000		9,000	Order accepted.
2	MA Jun23		20,000	4,000	Order accepted. Order quantity is 20,000 lots but each lot is only 5 tonnes. To equate the mini to the

Order	Order book	Bid	Offer	Limit utilisation	PTRM position
					main Aluminium contract the quantity is multiplied by its PTRM multiplier of 0.2 resulting in a limit utilisation of 4,000 lots.
3	AH Jun23		20,000	20,000	Order rejected – Member limit breach.
4	*AH 2023Q3 (Average)*	*5,000*		*5000 per tradable instrument*	*Order accepted.* *The Average has 3 legs with a total traded quantity for all the legs which would add up to 15,000. For the utilisation calculation the legs are split into outrights and assessed individually. For each outright instrument the quantity allocated will be based on a leg ratio, which in this case will be 1:1:1. The PTRM Multiplier on the legs and the strategy will be 1.*
5	*AH 3M-2023Q1 (Carry Average)*	*4,000*		*12,000 for 3M tradable instrument and 4,000 per leg tradable instrument in Average*	*Order accepted.* *The Carry Average has 4 legs which means that each leg will trade the quantity according to its leg ratios. The 3M leg will trade 3 x 4000 = 12,000 and each leg of the Average will trade 4,000 lots. The 3M leg is under the 15,000 per order limit as is each leg of the average. The contract lot size is 25 therefore the PTRM multiplier for the strategy and each leg is 1.*

3.2.5.2   Order Handling

A risk check is performed on all orders on submission, persisted orders are also validated on restatement and rejected if they fail. Stop orders are not revalidated when the order is triggered.

Mass quotes are risk checked per quote side. Where a side is rejected, the quote pair will be rejected. Each pair will be accepted or rejected explicitly.

Total order quantity is considered for Iceberg orders.

RFQs and implied orders are not subject to any risk checks as they are not considered to have committed exposure. For the notional value limit type, the order price used in the utilisation calculation is determined by the order type:

- For Limit orders, this is the limit price.
- *For Market, Stop Market and One Cancel Other orders, the calculation considers the maximum exposure that can possibly be realised as follows:*

  - *For Market and Stop Market orders, the price used for both bids and offers is the most stringent upper price band/limit.*
  - *For OCOs the calculation uses the largest notional value of the two components of the order.*

For utilisation calculation examples, see Utilisation Exposure for Market orders.

3.2.5.3   Strategy Handling

The utilisation calculation for Carry strategies uses the quantity from one leg. *For Carry Averages the quantity will be multiplied by the number of months in the average leg. For Averages the quantity will be multiplied by the duration of the average, eg, 3 for a 3 month Average.*

For strategies other than Carries, each component leg will be calculated and considered as an outright leg. If any legs in the strategy fail validation, the entire strategy will be rejected.

For the notional value limit type, the utilisation calculation uses leg prices derived by the strategy leg price algorithm, see Strategy Leg Pricing. For calculation examples, see Utilisation Exposure for Strategies.

The utilisation calculation for a delta hedge strategy uses all the legs in the strategy. Futures leg(s) will contribute to the option utilisation pool, see Utilisation Pools.

For quantity based limit types, delta hedge strategy utilisation is calculated as follows:

Order quantity x delta x PTRM multiplier.

For the notional value limit type, delta hedge strategy utilisation is calculated as follows:

- *Options legs: strike price x lot size x order quantity*
- *Futures legs: defined leg price x lot size x order quantity x delta*

3.2.6   Kill Switch

LME or member risk managers can use the kill switch at member, risk group or end client level to either:

- Suspend order submission but allow order cancellation
- Block trading activity and pull orders.

Enacting the kill switch affects the related entities at that level and below in the hierarchy, see LME and Member Configuration. For example, a kill at GCM level will also encompass all the GCMs risk groups and end clients and those of the NCMs, their risk groups and end clients. Once enacted the kill switch state will persist until explicitly lifted.

The kill switch state of an entity lower in the risk hierarchy can be blocked even though a higher level can be suspended. For example, an end client in a risk group can be blocked while the risk group is suspended.

The following table contains the application of a kill switch by a member to initiate a kill or reinstate and the affected level in the risk hierarchy:

Initiating Party and Target	Kill level	Reinstate level
Clearing member on themselves and their entities	Member, all risk groups, all end clients and any NCMs	Member, all risk groups, all end clients including NCMs or Member, all risk groups, all end clients excluding NCMs
Clearing member on an NCM	Specific NCM	Specific NCM
Member on themselves	Member, all risk groups and all end clients	Only the member level but not risk groups or end clients
Member on a risk group	Specific risk group within the member and all end clients within the risk group	Specific risk group within the member and all end clients within the risk group or Specific risk group within the member but not end clients in the risk group
Member on an end client	Specific end client in any risk group	Specific end client in any risk group

The originator of a successful kill switch or reinstate instruction will be notified by the Risk Management Gateway that the request has been accepted and a further confirmation will be sent once the instruction has been processed.

A trader can infer when the kill switch has been enacted to block trading activity and pull orders by unsolicited order cancellations with the reason stated. If the kill switch has been enacted during market closed, cancellations for persisted orders will be received on reconnection on the next business day only.

Lifting of a kill (reinstatement) can only be performed by the party (LME or member) that enacted the kill. The LME cannot reinstate a member enacted kill nor can a member lift a kill enacted by the LME.

The risk manager can reinstate at any level in the participant hierarchy assuming that the level above in the hierarchy is still active. For a member level kill, the risk manager can reinstate the member and all the related risk groups and end clients or reinstate just the member but not the risk groups and end clients. A kill at risk group level can be reinstated to include or exclude the end clients of that risk group.

Notifications will be sent to the relevant risk managers when a kill or reinstate instruction affects a related party, for example, a kill on a GCM at member level will also kill their NCMs.

3.2.7   Inbound Message Throttle

A message throttle limits the maximum number of messages that can be submitted per second and per day by a Risk Management Gateway user (Comp ID). Messages submitted in excess of the throttle limit will result in those messages being rejected by the gateway.

4   Pricing

4.1   Definition

Each contract has a defined price format according to which all order and trade prices are validated. Futures outrights have a standard price format representing a denominated currency value.

Futures strategies trade a net price format according to the definition of the strategy. This is the price differential between multiple derivative contracts within a multi-contract strategy. The net price is calculated according to the leg structure of the strategy by netting off buys and sells, see Strategy Leg Pricing. For example, the price of a Carry strategy will be the price of first leg minus the price of second leg.

4.2   Tick Size

The tick size defines the minimum price increment that can be used when entering an order. The tick size can vary by tradable instrument and is published in the contract specification. For example, strategies may have a different tick size to outrights however in all cases the trade price is an integer multiple of the tick size.

Where strategy order books trade at a different tick size to the outright order books of their legs, it is possible for a strategy leg to be assigned a trade price with a tick size that is more granular to the outright prompt for that leg.

Example 1: Outright and strategy tick sizes

In Copper futures, if outrights are configured to trade in 50 cent intervals and Carries in 1 cent intervals.

Order book	LFC price
M1	6335.00
M2	6348.50
M3	6359.50

LMEselect v10 assigns the traded leg prices according to the strategy price algorithm, see Strategy Leg Pricing.

M1 is assigned the LFC price of 6335.0 and the differential is assigned to the back leg which is assigned a trade price of 6359.35.

Carry	LFC price	Trade price	Leg 1 price	Leg 2 price
M1-M3	24.5	24.35	6335.0	6359.35

4.3   Reference Price

The Live Forward Curve (LFC) is a set of outright reference prices for all available prompt dates within a futures contract. *The Options Fair Value (OFV) is a set of outright reference prices for all available option strikes in an options contract.* LFC *and OFV* are calculated in the LME Pricing service.

The LFC*/OFV* is used as a basis to calculate the price for executed strategy orders.

4.4   Price Bands/Limits

The following price bands/limits are provided by the LME Pricing service:

	Dynamic price band	Static price band	Daily price limit
Calculation methodology configuration	Symmetric or asymmetric dollar offset applied to the current LFC/*OFV*	Symmetric or asymmetric dollar offset applied to the current LFC/*OFV*	Symmetric percentage applied to the previous day's closing price
Refresh rate*	Dynamic in response to price movements	Periodic intervals throughout the day	Start of day
Validation	Bids are validated against the most stringent upper price band limit Offers are validated against the most stringent lower price band limit	Bids are validated against the most stringent upper price band limit Offers are validated against the most stringent lower price band limit	Both bids and offers are validated against upper and lower daily price limits
Order Type	*OCO, both component orders validated, see* Price Bands/Limits for OCOs		*OCO, both component orders are validated*
	Stops - Stop tolerance, based on tightest band, see Price Bands/Limits for Stops		Both the Stop trigger and Stop price are validated
	Market – Price assigned is the most stringent band/limit, see Market		
Persisted orders	On order entry Stop tolerance at start of day restatement		On order entry and start of day restatement
Order book	Outrights and strategies, see Price Bands for Strategies	Outrights	Futures outrights (excluding TAR)

*Participants should be aware that the exchange can change the price band width in response to market conditions during the trading day.

4.5   Price Band/Limit Application

LMEselect v10 applies the price bands/limits which are calculated by the LME Pricing service and can be adjusted by Trading Operations.

Orders are subject to price validation as configured by the LME against daily price limits, dynamic and static price bands. If a bid or offer is entered at a price outside the most stringent price band/limit, the order is rejected. Note any price improvement or rounded price allocation is also validated against price bands/limits. Implied orders will be recalculated in response to changes in price bands/limits and will not be generated outside price bands/limits.

The LME can enable or disable the application of price bands/limits in real time.

All tradable instruments in a merged order book will be validated against a single set of price bands/limits.

4.5.1   Price Bands/Limits for Stops

Example 1: Futures Stop price tolerance

Assume a previous day's closing price of 1800 and current reference price of 1854.50 for Aluminium Cash.

Type	Lower price band/limit			Upper price band/limit		
Type	Dynamic	Static	Daily	Dynamic	Static	Daily
Offset	$50	$50	$75	15% ($270)	$75	15% ($270)
Explicit	1804.50	1904.50	1929.50	2070	1779.50	1530
Stop Price Tolerance	$50			$50		

A Stop Limit order is submitted as a bid for 1900.00 with a Stop trigger price of 1855.50:

- The Stop price tolerance is validated, this the difference between the Stop price of 1855.50 and the limit price of 1900.00. The difference is less than the $50 Stop price tolerance, (1900.00 – 1855.50 = 44.5).
- The Stop limit and trigger price are within daily price limits, therefore the order passes validation and is accepted.

A Stop Limit order is submitted as an offer at 1785.00 with a Stop trigger price of 1835.50:

- The Stop limit and trigger price is within daily price limits however the Stop price tolerance (1835.50 - 1785.00 = 50.5) is greater than the $50 Stop price tolerance and the order is rejected.

Example 2: Options Stop order triggered

The LME Pricing service provides LMEselect v10 with the following price bands for a 6050 call:

OFV	Dynamic lower price band	Static lower price band	Dynamic upper price band	Static upper price band
50	40	70	60	70

A Stop Limit order is submitted as a bid for 71 with a Stop trigger price of 68. The limit price is outside dynamic and static price bands but as validation is not performed on order entry the order is accepted.

The LME Pricing service provides LMEselect v10 with updated dynamic price bands following a change to the OFV:

OFV	Dynamic lower price band	Static lower price band	Dynamic upper price band	Static upper price band
67	57	70	77	70

An order trades at a price of 68 triggering the Stop Limit order. The Stop Limit price is validated against price limits:

- *The limit bid of 71 is lower than the dynamic upper price band limit of 77 and so passes dynamic price band validation.*
- *The limit bid of 71 is higher than the static upper price band limit of 70 and so the price is converted to the static price band of 70 and entered into the order book.*

4.5.2 Price Bands/Limits for OCOs

Assume the following prices and price band/limit configuration in the market:

LFC M1: 6120. M2: 6137, previous day's closing price for M1 and M2: 6100

	Lower price band/limit			Upper price band/limit		
Type	*Dynamic*	*Static*	*Daily*	*Dynamic*	*Static*	*Daily*
Offset	*$50*	*$75*	*15% ($270)*	*$50*	*$75*	*15% ($270)*
Explicit	*1804.50*	*1779.50*	*1530*	*1904.50*	*1929.50*	*2070*
Stop Price Tolerance	*$50*			*$50*		

An OCO is submitted into M1 as a limit bid for 6118 with a Stop limit trigger price of 6130 and a triggered limit price of 6141:

- *The limit bid for 6118 is less than the price band upper limit of 6130 which passes price band validation.*
- *The Stop trigger price of 6130 is greater than the current best bid of 6120 which passes Stop price validation.*
- *The limit bid price of 6118, Stop limit trigger price of 6130 and triggered limit price of 6141 are within daily price limits (5185-7015) and pass price limit validation.*
- *The difference between the Stop trigger price and the Stop limit price is calculated as (6141 – 6130 = 11). This is greater than the Stop tolerance value of $10 and therefore the entire OCO is rejected by LMEselect v10.*

An OCO is submitted into M1 as a limit bid for 6126 with a Stop limit trigger price of 6135 and a triggered limit price of 6141:

- *The limit bid for 6126 is less than the price band upper limit of 6130 which passes price band validation.*
- *The Stop trigger price of 6135 is greater than the current best bid of 6120 which passes stop price validation.*
- *The limit bid price of 6126, Stop limit trigger price of 6135 and triggered limit price of 6141 are within daily price limits (5185-7015) and pass price limit validation.*
- *The difference between the Stop trigger price and the Stop limit price is calculated as (6141 – 6135 = 6). This is less than the Stop tolerance value of $10 and is accepted by LMEselect v10.*

An OCO is submitted into M2 as a limit offer at 6126 with a Market Stop trigger price of 6110:

- *The limit offer at 6126 is less than the price band lower limit of 6127 which fails price band validation and the order submission is rejected by LMEselect v10.*

- *The order would have passed daily price limits as Limit offer at 6126 and Market Stop trigger price of 6110 are within 5185-7015.*
- *The order would also have passed Stop price validation as the Stop trigger price of 6110 is less than the current best offer of 6135.*

An OCO is submitted into M2 as a limit offer at 6126 with a Market Stop trigger price of 6115:

- *The limit offer at 6126 is greater than the price band lower limit of 6127 which passes price band validation.*
- *The limit offer at 6126 and Market Stop trigger price at 6115 are both within the daily price limits (5185-7015) and pass price limit validation.*
- *The Stop trigger price of 6115 is less than the current best offer of 6135 which passes stop price validation and is accepted by LMEselect v10.*

4.5.3 Price Bands for Options

The LME Pricing service provides LMEselect v10 with the following price bands for the Copper Jun23 5600 call:

OFV	Dynamic lower price band	Static lower price band	Dynamic upper price band	Static upper price band
16	13	7	19	17

An incoming bid is submitted at a price of 18 is validated against the lower of the dynamic and static upper price bands. The order passes dynamic price band validation but is greater than the static price band and so is rejected.

An incoming offer is submitted at a price of 15 is validated against the higher of the dynamic and static lower price bands. The order is greater than both price bands and so is accepted.

4.5.4 Price Bands for Strategies

For strategy price bands, the LME Pricing service calculates the band to be applied to the strategy (exchange defined or custom) as follows:

- Carries – Leg price band for the adjustable leg only. The adjustable leg is the far leg of the Carry, unless that far leg is the 3M or Tom prompt. When the far leg is the 3M or Tom prompt, the adjustable leg is the near leg.
- *Averages – Strategy level price band*
- *Carry Averages – Leg price band to be applied to the average leg*
- *Custom strategies (futures) – Leg price band to be applied to each leg*
- *Custom strategies (options) – Strategy level price band.*

See Price Bands for Strategies for examples.

4.5.4.1 Carries

Example 1: Price bands applied to 2nd leg

For an Oct23-Nov23 Carry, leg 1 (Oct23) is the nearest prompt date and leg 2 (Nov23) is the furthest prompt date. The nearest prompt date, leg 1 is used as the reference price and price bands are applied to the adjustable leg which is leg 2.

The LME Pricing service provides price bands of $5 using a reference price of 1866.5 for the Nov23 leg of the Oct23-Nov23 Carry.

LMEselect v10 calculates the implied reference price for Nov23 leg 2 by subtracting the Carry order price from the Oct23 leg 1 reference price.

Strategy dynamic price bands for Nov23		Leg 1 reference price	Carry order price	Implied leg 2 reference price
Lower limit	Upper limit			
1861.5	1871.5	1865	5	1860

If the Carry was submitted as a bid (buy leg 1 and sell leg 2), the implied leg 2 price of 1860 is below the lower price band of 1861.5 and therefore the order is rejected.

If the Carry was submitted as an offer (sell leg 1 and buy leg 2), the order is accepted as the implied leg 2 price of 1860 is below the upper price band.

Example 2: Price bands applied to 1st leg when 2nd leg is 3M

If the strategy includes a 3M leg as leg 2, for example Nov23-3M, this is used as the reference price and price bands are applied to the adjustable leg which is leg 1.

A Nov23-3M Carry strategy is submitted with an order price of -4.

The LME Pricing service provides price bands of $5 using a reference price of 1866.5 for the Nov23 leg of the Nov23-3M Carry. LMEselect v10 calculates the implied reference price for Nov23 leg 1 by adding the Carry order price from the 3M leg 2 reference price.

Strategy dynamic price bands for Nov23		3M leg 2 reference price	Carry order price	Implied leg 1 reference price
Lower limit	Upper limit			
1861.5	1871.5	1876	-4	1872

If the Carry was submitted as a bid (buy leg 1 and sell leg 2), the implied leg 1 reference price of 1872 is above the upper price band of 1871.5 and therefore the order is rejected.

If the Carry was submitted as an offer (sell leg 1 and buy leg 2), the order is accepted as the implied leg 1 reference price of 1872 is above the lower price band of 1861.

4.5.4.2   Average

The LME Pricing service provides the following upper and lower price band limit that is applied to the Average strategy price:

- *Upper price band limit = 1857.25*
- *Lower price band limit = 1837.25*

If the Average was submitted as a bid for 1870.00, the order is rejected as the order price is greater than strategy dynamic price band upper limit of 1857.25.

If the Average was submitted as an offer at 1870.00, the order is accepted as the order price is greater than the strategy dynamic price band lower limit of 1837.25.

4.5.4.3   Carry Average

The LME Pricing service provides the strategy price band to be applied to the adjustable leg of the Carry Average, which is the nested 'Average' strategy.

A 3M-3Q23 (Jul/Aug/Sep) Carry Average strategy is submitted with an order price of 40.

LMEselect v10 calculates the implied reference price for 3Q23 leg 2 by subtracting the Carry order price from the 3M leg 1 reference price.

Strategy dynamic price bands for 3Q23		3M leg 1 reference price	Carry order price	3Q23 implied leg 2 reference price
Lower limit	Upper limit			
1837.25	1937.25	1875.58	40	1835.58

If the Carry Average was submitted as a bid, the implied leg 2 price of 1835.58 is below the lower dynamic price band limit of 1837.25 and therefore the order is rejected.

If the Carry Average was submitted as an offer, the order is accepted as the implied leg 2 price of 1835.58 is below the upper dynamic price band limit of 1937.25.

4.5.4.4   Custom Strategies (Futures)

For custom strategies, price bands are applied at leg level.

Assume the following LFC prices and dynamic price band configuration have been provided by the LME Pricing service to LMEselect v10:

Order book	LFC price	Price band lower value	Price band lower limit	Price band upper value	Price band upper limit
M1	6108	$10	6098	$7.5	6115.5
M2	6112	$10	6102	$7.5	6119.5
3M	6115	$10	6105	$7.5	6122.5
M3	6117	$10	6107	$7.5	6124.5
M4	6120	$10	6110	$7.5	6127.5

4.5.4.4.1 Equal Ratio Custom Strategy (Futures Condor)

A buy order is submitted into the custom Condor strategy (buy M1, sell M2, sell M3, buy M4) with a price of 6.

LMEselect v10 calculates the implied leg price for each leg by applying the strategy leg price algorithm for custom strategies:

It calculates the custom (Condor) price using the current LFC prices in the table above:

M1 – M2 – M3 – M4

6108 – 6112 – 6117 – 6120 = - 1 = 1

It calculates the difference between the entered price and the current LFC price = -6 – (-1) = -5

The difference is then allocated in minimum price movement increments of 0.5 to each leg beginning with the furthest leg:

Leg 1 (M1) = 6108 + (-) 1 = 6107

Leg 2 (M2) = 6112 – (-) 1 = 6113

Leg 3 (M3) = 6117 – (-) 1.5 = 6118.5

Leg 4 (M4) = 6120 + (-) 1.5 = 6118.5

The implied leg price of each leg is then validated against the strategy price band values for the leg. Each of the legs are within the price band and therefore the order is accepted.

4.5.4.4.2 Ratio Custom Strategy (Futures Butterfly)

A buy order is submitted into the custom Butterfly strategy (buy M2, sell 2x M3 and buy M4) with a price of - 3.

LMEselect v10 calculates the implied leg price for each leg by applying the strategy leg price algorithm for custom strategies (see Custom Strategies):

It calculates the custom (Butterfly) price using the current LFC prices in the table:

M2 – M3 – M3 + M4

6112 – 6117 – 6117 + 6120 = - 2

It calculates the difference between the entered price and the current LFC price:

-3 – (-2) = 1

The difference is then allocated in minimum price movement increments to each leg beginning with the furthest leg:

Leg 1 (M2) = 6112 + (-) 0.5 = 6111.5

Leg 2 (M3) = 6117 = 6117

Leg 3 (M4) = 6120 + (-) 0.5 = 6119.5

Note when determining the implied leg price ratio, legs must have price adjustments assigned in completeness and where this is not possible the adjustment moves to the next leg. The minimum price movement allocation of 0.5 cannot be allocated to leg 2 as it has a leg ratio of 2 so the 0.5 difference is assigned to leg 1.

The implied leg price of each leg is then validated against the strategy price band values for the leg. Each of the legs are within the price band and therefore the order is accepted.

4.5.4.5   Premium based Option Custom Strategy (Butterfly)

The LME Pricing service provides the customs option strategy net price band upper and lower limits for each strategy.

Assume the following price bands have been provided by the LME Pricing service for an options Butterfly:

Strategy	Lower price band limit	OFV (calculated net price)	Upper price band limit
C6150 C6175 C6200 (B1:S2:B1)	-2	1	6

A buy order is submitted into the 6150/6175/6200 Butterfly with a price of 4. LMEselect v10 simply validates the incoming bid against the strategy upper price band value 6 and the order successfully passes price band validation.

Appendix A: Product Hierarchy
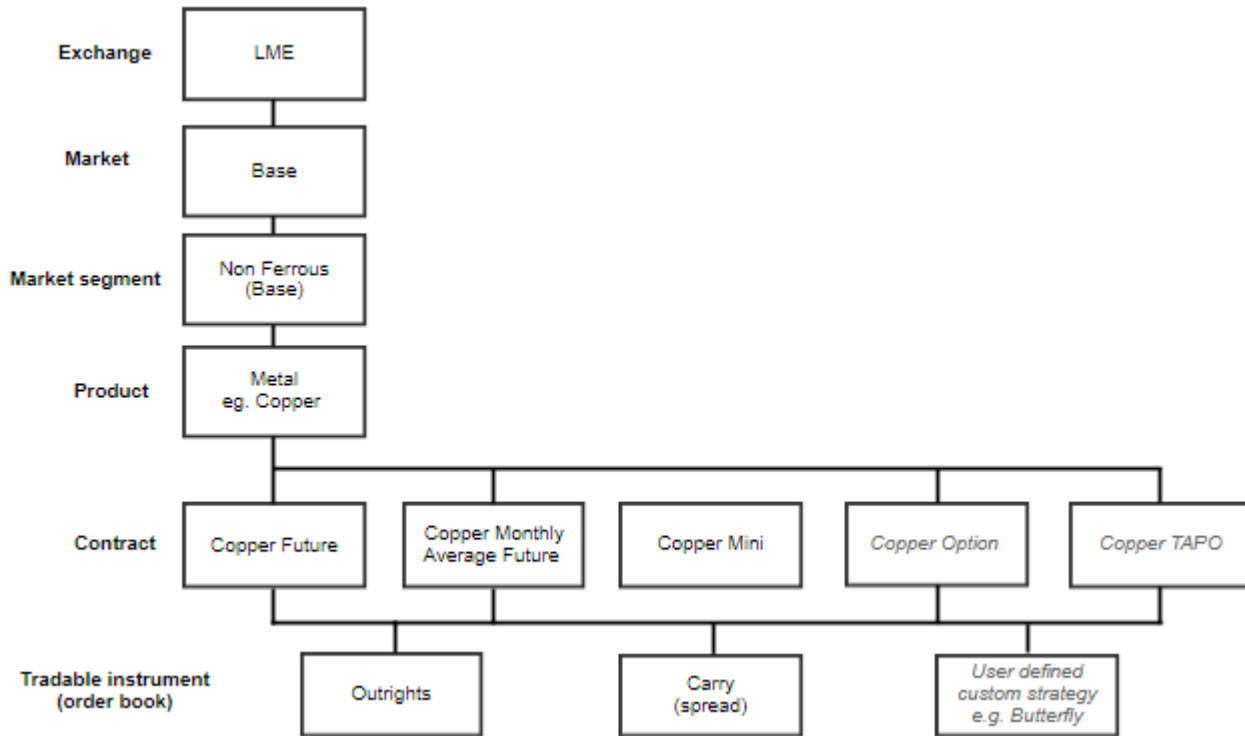
Note for PTRM the product hierarchy will be as shown in Utilisation Pools.

Appendix B: PTRM Utilisation Calculation Examples

The following examples illustrate utilisation calculation principles for the notional value limit type.

Note: assume that dynamic and static price bands are within daily price limits.

B.1   Utilisation Exposure for Market orders

In the limit utilisation calculation, a Market order will be given a price on order submission which will be determined on maximum exposure.

Example 1: Market order

Assume the following price band limits have been set for Aluminium futures based on the current reference price 1807 and a price band of $10:

- *Lower price band limit: 1797*
- *Upper price band limit: 1817*

The lot size for the contract is 25

The member has set the Per Order Notional Value limit at $350,000 for Aluminium futures.

The following orders are submitted:

- *Order 1: Limit bid for 1800 for 2 lots*
- *Order 2: Limit bid for 1805 for 6 lots*
- *Order 3: Market offer for 8 lots.*

The calculation for Market orders for notional limits will use the quantity entered and the price assigned according to the upper price band.

Order	Bid	Offer	Notional value	PTRM position
1	1800 (2)		$90,000	Order accepted. *Notional value:* *Order price x quantity x lot size* *1800 x 2 x 25 = 90000*
2	1805 (6)		$270,750	Order accepted. *Notional value:* *1805 x 6 x 25 = 270,750*
3		1817 (8)	$363,400	Order rejected – member limit breach. *The Market order converts to a Limit order at 1817 (upper price band limit):* *Notional value:* *1817 x 8 x 25 = 363,400*

Example 2: OCO Market

Assume the following price band limits have been set for Aluminium futures based on the current reference price 1807 and a price band of $10:

- *Lower price band limit: 1797*
- *Upper price band limit: 1817*

The lot size for the contract is 25.

The member has set the Per Order Notional Value limit at $400,000 for Aluminium futures.

The following orders are submitted:

- *Order 1: OCO for 6 lots with a limit offer at 1810 and a Stop Market trigger price of 1809*
- *Order 2: OCO for 10 lots, with a limit bid for 1805 and a Stop Market trigger price of 1818*

The limit utilisation calculation for the OCO order uses the largest potential executable price between the two components, which in this case is the greater of either the:

1. *Limit price*

2. *Market price, which will be the trigger price + upper price band differential = (1809 + 10)*

Upper price band differential is the difference between OFV/LFC and upper price band value supplied by the LME Pricing service.

Order	Bid	Offer	Notional value	PTRM position
1		*1810 (6)*	*$272,850*	*Order accepted.* *Order 1 has a limit price of 1810 and a potential Market price of 1809 + 10 = 1819.* *Notional value:* *1819 x 6 x 25 = 272,850*
2	*1805 (9)*		*$411,300*	*Order rejected – member limit breach.* *Order 2 has a limit price of 1805 and a potential Market price of 1818 + 10 = 1828.* *Notional value:* *1828 x 9 x 25 = 411,300*

B.2   Utilisation Exposure for Strategies

Example 1: Carry futures – Market order

Assume the following LFC reference prices and Carry dynamic price band values have been provided for Aluminium futures:

Order book	LFC price	Price band lower value	Price band lower limit	Price band upper value	Price band upper limit
M1	*1810*	*10*	*1800*	*10*	*1820*

Order book	LFC price	Price band lower value	Price band lower limit	Price band upper value	Price band upper limit
M2	1800	15	1785	15	1815
3M	1790	10	1780	20	1810

The lot size for the contract is 25.

The member has set the Per Order Notional Value limit to $25,000 for Aluminium futures (applicable to Trader B).

The following orders are submitted by Trader A into the M1-M2 order book:

Order	Bid	Offer
1	1.5 (5)	
2	2.0 (7)	
3	2.5 (3)	

The following order is submitted by Trader B:

Order	Bid	Offer	Notional value	PTRM position
4		Market (10)	$6,250	Order accepted. Derive the price differential as an absolute value: If leg 1 is non-adjustable leg[3]: - leg 1 LFC price – leg 2 most stringent lower price band/limit If leg 2 is non-adjustable leg: - leg 1 most stringent upper price band – leg 2 LFC price band/limit M1 LFC price – M2 upper price band limit (1810 – 1785) = 25 (absolute) Notional value: Price differential x lot size x order quantity $25 x 25 x 10 = 6,250

---

[3] To determine the non-adjustable leg, see Strategy Leg Pricing – Carries.

Order	Bid	Offer	Notional value	PTRM position
5	Market (50)		$31,250	Order rejected – member limit breach.

Example 2: Futures Custom Strategies – Market order

For all Custom strategies the lot size / value of each leg must be within their respective limits.

Notional value is calculated as the largest price (derived below) x lot size x order quantity

Assume the following LFC prices and price band values have been provided for Copper futures:

Order book	LFC price	Static price band lower limit	Dynamic price band lower limit	Static price band upper limit	Dynamic price band upper limit
M1	6108	5900	6098	6110	6113
M2	6112	6000	6102	6150	6117
M3	6117	6000	6107	6175	6120
M4	6120	6050	6110	6250	6125

The lot size for the contract is 25.

Custom Condor – Market order

The member has set the Per Order Notional Value limit to $306,000 for Copper futures (applicable to Trader A).

The following strategy is submitted by Trader A:

Order	Order book	Bid	Offer
1	Custom Condor M1/M2/M3/M4 (B1:S1:S1:B1)	Market (2)	

The notional value calculation for each of the legs in the strategy uses the most stringent of either the:

- *Dynamic upper price band limit*
- *Static upper price band limit*
- *Daily price limit.*

Using the price band/limit table notional value is calculated as:

Defined leg price x lot size x order quantity x leg ratio

Order 1 legs	Price	Notional value	PTRM position
M1 (Buy)	6110	$305,500	Order rejected – member limit breach.

Order 1 legs	Price	Notional value	PTRM position
M2 (Sell)	6117	$305,850	Leg 4 is over the $306,000 limit.
M3 (Sell)	6120	$306,000	Notional value:
M4 (Buy)	6125	$306,250	Leg 1: 6110 x 25 x 2 x 1 = 305,500
			Leg 2: 6117 x 25 x 2 x 1 = 305,850
			Leg 3: 6120 x 25 x 2 x 1 = 306,000
			Leg 4: 6125 x 25 x 2 x 1 = 306,250

Example 3: Options Strategies

Per Order Notional Value at Aluminium option level:

- *Member limit set to $280,000*

The lot size for the contract is 25

The notional value calculation uses the strike price not the order price.

The following strategies are submitted:

Order	Order book	Bid	Offer	Notional value	PTRM position
1	Custom option Straddle Mar23 P2100 C2100 (S1:S2)		10 (5)	Leg 1: $262,500 Leg 2: $262,500	Order accepted. Notional value: 5 x 25 x 2100 = 262,500
2	Custom option Strangle Sep23 P1990 C2500 (B1:B2)	30 (5)		Leg 1: $248,750 Leg 2: $312,500	Order rejected – Leg 2 member limit breach. Notional value: 5 x 25 x 1990 = 248,750 5 x 25 x 2500 = 312,500
3	Call Spread versus underlying Oct23 C1990 C2200 Oct23 2000 (S1:B1:B1)	Stop Market (5)		Leg 1: $248,750 Leg 2: $275,000 Leg 3: $250,000	Order accepted. Notional value: 5 x 25 x 1990 = 248,750 5 x 25 x 2200 = 275,000 5 x 25 x 2000 = 250,000