



# Member and Client Default Management Framework

## Table of Contents

1	Introduction	3
1.1	Purpose of the document	3
1.2	Roles and Responsibilities	3
1.3	Default Waterfall	4
2	Pre Default key activities	5
2.1	Default Broker Arrangements	5
2.2	Risk Management	5
2.3	Default Fire-drills	5
2.4	Credit Assessment and Financial Resources	6
2.5	Regulatory Liaison	6
3	Default Activation	6
4	Active Default Management	6
4.1	Default member's un-registered positions	6
4.2	Non-cash Collateral	6
4.2.1	Collateral Liquidity Risk Review	6
4.2.2	Collateral Market Risk Review	7
4.2.3	Collateral Credit Risk Review	7
4.2.4	Execution of Collateral Default Management Strategy	7
4.3	Delivery Management	7
4.3.1	Existing deliveries	7
4.3.2	Upcoming deliveries	8
4.4	Client Porting	8
4.4.1	Porting Period	8
4.4.2	Pricing	8
4.4.3	Partial Porting	9
4.4.4	Batch Porting	9
4.4.5	Order of porting	10
4.5	Hedging	11
4.6	Default Auction	11
4.6.1	Member participation criteria	11
4.6.1	Multi-Asset Auction	13
4.6.2	The Auction process	14
4.6.3	Acceptance of the bid	15
4.6.1	Default Fund juniorisation	15
4.6.2	Payment process	18
4.6.3	Failed Auction	18
4.7	Default Fund replenishment and stabilisation fund	19
4.7.1	Replenishment	19
4.7.2	Stabilisation Fund	19
4.8	VM Haircutting	19
5	Post Default	20
6	Two Member Default	20
7	Appendix A: Default fund contribution example of multiple auction	21
8	Appendix B: Variation Margin Gains Haircutting examples	22
9	Appendix C: Examples of splitting auction portfolio	23

- 9.1 Example 1 – Splitting the portfolio 23
- 9.2 Example 2 – Splitting the portfolio 23
- 9.3 Example 3 – Splitting the portfolio 24

# 1 Introduction

This document outlines LME Clear’s framework for the management of a clearing member default.

Ultimately LME Clear will aim at protecting the non-defaulting members in the event of a default. The key principles that LME Clear will follow in the event of a clearing member default are:

- Manage the default in accordance with its Rules and Procedures
- Protect LME Clear’s capital, the Default Fund and the integrity of the markets for which it clears;
- Transfer client positions and collateral in Direct Individual Segregated Accounts, Indirect Individual Segregated Accounts and Indirect Gross Omnibus Segregated Accounts (each an Individual Segregated Account (**ISA**)); and
- Transfer client positions, and if possible collateral, in Direct Net Omnibus Segregated Client Accounts, Direct Gross Omnibus Segregated Client Accounts, Indirect Net Omnibus Segregated Client Accounts (each an Omnibus Segregated Account (**OSA**)).

## 1.1 Purpose of the document

This document provides to clearing members a description of the key activities potentially required by LME Clear in the risk management of a clearing member default and its interactions with clearing members / clients. Specifically it is to cover

- An overview of the high level process
- Details of the key roles and responsibilities
- Any key timescales within the process

This framework document is supported by a detailed set of operating procedures and a checklist to carry out core activities.

This document is provided to Members in order to help them understand the rights and obligations which they have under the LME Clear Rules. It is not a substitute for reading the LME Clear Rules and does not create any rights and obligations which are additional to those in the LME Clear Rules. In the event that there is any contradiction between the provisions of this document and the LME Clear Rules then the LME Clear Rules shall take precedence.

## 1.2 Roles and Responsibilities

### Default Management Committee (DMC)

**Purpose:** The LME Clear Board has delegated overall responsibility to the DMC for the default management process and all related strategic decision making involved in the risk reduction/neutralisation strategy and the subsequent auction employed by LME Clear.

The DMC is chaired by the LME Clear CEO and includes senior management of LME Clear. . . Default Procedure Part C of the Rulebook sets out the list of members of the DMC.

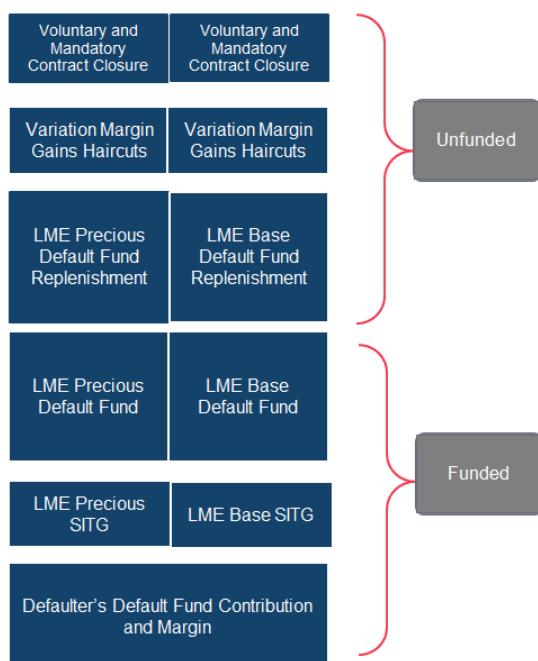
The DMC terms of reference outline the key responsibilities of the Committee.

### 1.3 Default Waterfall

Where there is a Default Loss remaining following the exercise of LME Clear's default procedures, the Default Loss shall be satisfied in the following order to priority:

- first, LME Clear will apply all Collateral provided by the defaulting Member in or towards the discharge of the Default Loss in accordance with the Rules;
- secondly, if the Collateral provided by the defaulting Member is not sufficient to discharge the Default Loss, LME Clear will apply the Default Fund contribution of the defaulting Member in or towards the discharge of the outstanding balance of the Default Loss;
- thirdly, if the Default Fund contribution of the defaulting Member is not sufficient to discharge the balance of the Default Loss, LME Clear will apply its Dedicated Own Resources in or towards the discharge of the outstanding balance of the Default Loss;
- fourthly, if the Dedicated Own Resources of LME Clear are not sufficient to discharge the outstanding balance of the Default Loss, LME Clear will apply the Default Fund contributions of non-defaulting Members on a pro rata basis in or towards the discharge of the remaining balance of the Default Loss; and
- fifthly, if further resources are required the process will enter the unfunded section, as documented in the LME Clear Recovery Plan.

LME Clear has two separate Default Funds: one for the LME Base Service and one for the LMEprecious Service. The segregated default waterfall for the LMEprecious Service ensures a conservative approach in order to limit the possibility of contagion across the two Service following a Default and provide the strongest incentives for default management. The segregated default waterfall is given below;



The key features of this approach are;

- No underwriting of LMEprecious Service by the LME Base Service and vice versa

- In the event of exhaustion of either LMEprecious or Base Default Funds then the other Default Fund Contribution of the Defaulting Member is immediately available, if a member participates in both Services.
- After the use of funded resources the waterfall reverts to independent replenishments

## 2 Pre Default key activities

### 2.1 Default Broker Arrangements

LME Clear ensures that it has in place, at all times, arrangements for the execution of hedging, liquidation, repo and other trades that it will require for the management of a Default. LME Clear ensures these arrangements are tested and refreshed on a regular basis.

### 2.2 Risk Management

In order to be prepared for the default of any of its members, LME Clear has a clear view of the risk embedded in the portfolios of all clearing members and their collateral positions. LME Clear also monitors its other exposures arising from other counterparty relationships e.g. settlement banks, investment counterparts etc. and has appropriate tools and procedures in place to monitor such risk on an on-going basis. LME Clear also ensures that it has the appropriate resources and procedures to allow the day to day operations of the CCP to continue as normal during a default event.

### 2.3 Default Fire-drills

LME Clear undertakes periodic fire drills to test the technical and operational readiness of its Default Management Procedures. These consist of both "internal" (not involving Members) and "external" (involving Members) fire drills:

- LME Clear undertakes at least four fire drills per annum to test the technical and operational readiness of the default management process and procedures.
- LME Clear performs an internal fire drill following a material change in the Default Management Policy or Framework (or the underlying procedures).
- LME Clear also performs a full end to end external fire drill every twelve months or following a material change in the Default Management Policy or Framework (or the underlying procedures). These fire drills include participation from existing Members as well as other relevant parties. Clearing member participation will include tests of porting documentation and default auction.
- Both internal and external fire drills are designed to test operational processes and, where relevant, the failure of associated counterparties including Cash Investment Agents, Settlement Banks, Concentration Banks, Liquidity Providers and Investment Counterparties. This testing includes both desktop activity and, where feasible, actual changes to activity and related transactions.

Each fire drill includes a review of the Default Management Procedures and the underlying processes in order to identify any defects, risks or issues and identify steps to be implemented to mitigate any such defects, risks or issues. A summary report of the fire-drill is written by LME Clear's operational teams and reviewed by the Clearing Risk Committee. A summary of each fire-drill is also presented to the Risk Advisory Group.

## 2.4 Credit Assessment and Financial Resources

During times of market stress, LME Clear will take additional steps to ensure that it is sufficiently covered for the risk in the portfolios of its Members at all times as well as to ensure that it maintains additional liquidity, where possible until later in the day, in its investment portfolio.

LME Clear monitors member internal credit ratings on an on-going basis and makes adjustments if required in line with the policies and methodologies. The impact of such adjustments may result in the following:

- The potential reduction of available intra-day thresholds of members and therefore the reduction of intra-day risk that LME Clear is exposed to.
- The potential requirement for members to lodge additional margin.
- The potential update of collateral eligibility for both margin cover purposes.

At all times LME Clear will be conscious of the impact of changes to ratings as potentially pro cyclical, and endeavour to limit this risk while ensuring LME Clear is appropriately protected.

## 2.5 Regulatory Liaison

LME Clear ensures regular dialogue with its regulators in the build-up to any potential default.

# 3 Default Activation

The LME Clear's Rules and Procedures identify the definitions of "an event of default" and its authority to serve a member with a Default Notice. LME Clear will inform its regulator before declaring a default by a Member. The LME Clear Chief Executive Officer or his delegate will, following advice from the Chief Risk Officer and the Chief Legal and Compliance Officer, determine that a default notice should be issued in respect of a Member. If so it will give notice to the Member and publish the notice on LME Clear's website. LME Clear will also communicate with all relevant stakeholders. This will include the LME, Members, the cash investment agents, custodians and settlement banks.

# 4 Active Default Management

## 4.1 Default member's un-registered positions

Dependent on the time of day the default notice is served, there may be positions in the clearing system exception queue or pending acceptance. A portfolio margin calculation will be performed on all positions of the defaulting member (including those not accepted) and the impact analysed. The resultant impact on the margin requirement will be reported to the DMC for confirmation on whether the trades should be accepted or rejected.

## 4.2 Non-cash Collateral

### 4.2.1 Collateral Liquidity Risk Review

In the event of a default, LME Clear assesses its liquidity requirements to continue its BAU activities, as well as any potential stresses caused by the prevailing market conditions and the impact of a defaulting member's positions over at least the next 5 working days. This will include an assessment

of the defaulter's collateral and any potential offsets versus cleared positions, forthcoming cash-flow ladder including for previously failed settlements, settlement banks arrangements and all cash inflows and outflows related to the LME Clear investment profile.

In performing the liquidity review, LME Clear will assess the required liquidity and the available liquidity as well as the strategy to generate cash liquidity using non-cash collateral assets if required.

#### **4.2.2 Collateral Market Risk Review**

LME Clear will assess the most recent valuation where required margin cover was received and calculate the price at which it would need to be sold in order to at least realise the associated cover valuation. Prices will be updated regularly, at least hourly, intra-day and compared to the break-even price; this information, as well as the currency and location of the assets, will form part of the decision making in relation of when assets are liquidated.

The market risk of longer dated positions will be assessed in terms of potential volatility and market insight may be sought from market experts where necessary.

#### **4.2.3 Collateral Credit Risk Review**

Both the defaulting member's collateral and other eligible collateral will be assessed in terms of credit impact during the stressed market conditions with consideration given to;

- Where applicable, liquidation of any collateral adversely impacted by the default event being given priority;
- How to treat any Collateral downgraded or put on negative watch by the Credit Risk team;
- Potential for haircut or eligibility amendments for margin collateral, at all times considering the need to avoid any pro-cyclical impact wherever possible.

#### **4.2.4 Execution of Collateral Default Management Strategy**

Following the determination of its liquidity requirements and evaluation of the related market and credit risk (including consultation with the default management brokers), LME Clear will decide upon and execute its liquidation strategy with an aim to create minimal market impact and only where possible obtain 2 quotes, executing against the best of these.

### **4.3 Delivery Management**

#### **4.3.1 Existing deliveries**

##### **4.3.1.1 Long Positions**

On the default day, if LME Clear is due to take delivery of a warrant (or gold/silver), in respect of an existing long position of the defaulting member then the required cash will need to be paid up front and the warrants received later in the day. LME Clear may decide to deliver back the warrant (or gold/silver), on the following day and receive cash, therefore shortening the liquidity impact. LME Clear captures the cash requirement to cover deliveries within its liquidity stress testing and liquidity portfolio management.

##### **4.3.1.2 Short Positions**

If LME Clear is due to deliver a warrant (or gold and silver under LMEprecious), then it would need to contact its default brokers to buy or borrow a warrant. Depending on the time of day and impact of

the default we would note that this will not always be possible to achieve. Any decision would be made by the DMC following consultation with the liquidity risk team, who will analyse the liquidity impact. LME Clear can then deliver the warrant and receive the cash.

#### 4.3.2 Upcoming deliveries

LME Clear will be aware of any potential positions in nearby prompts; the aim will be to either close, or roll the positions to a forward date, to prevent any positions going into delivery. The expected process will be to roll positions to maintain or reduce the overall risk profile of the defaulting member, to an appropriate prompt date, in consultation with the LME. The details of the actions of LME Clear will be disclosed to non-defaulting clearing members and clients so they are aware of the rolling of potential open positions and can react accordingly.

Any client portfolios that are due to be ported should be notified of the position changes resulting from the rolling process. Where accounts are due to port then the rolled positions should be included to ensure the risk profile of the portfolio is maintained.

### 4.4 Client Porting

In accordance with the Rules, where the porting requests for certain accounts are received or where the automated porting process apply, LME Clear will seek to port the positions and collateral allocated to such accounts to the nominated Transferee Member. The consent of the nominated Transferee Member is a condition to the porting, and such consent will need to be received by LME Clear within a timeframe notified by LME Clear.

The porting process can be initiated in one of two ways:

- (a) automatically by LME Clear, where the [Automatic Porting Process](#) applies to a Client Account; or
- (b) for any other Client Account, on receipt by LME Clear of a [Porting Request Notice](#) available at ([www.lme.com/LME-Clear/Rules-and-regulations/Client-Information](http://www.lme.com/LME-Clear/Rules-and-regulations/Client-Information)), submitted by all Clients allocated to the Client Account.

It is critical that the correct approval is provided by both the Client(s) and Transferee Member for the porting request to proceed. Note that porting requests can only be made by the direct Client or Clients represented in the account, even in respect of accounts that may be used for indirect clearing purposes.

For the transfer of positions, due to Client porting in a clearing member default, there will be no trading or clearing fees charged.

#### 4.4.1 Porting Period

The period within which porting may be requested is four hours following the declaration of a default. This means that the requesting Clients (if the Automatic Porting Process does not apply) and the Member Transferee must all have consented to the transfer within that four hour period. The DMC has the ability under the Rules to extend the porting period. A notice will be sent detailing the extension and the new agreed timeframes.

#### 4.4.2 Pricing

When positions are ported they should be completed at the following prices:

Product	Price
Forwards	Original trade price
Futures	Previous day's closing price
Options	Zero price

#### 4.4.3 Partial Porting

LME Clear may affect a transfer of the positions relating to some but not all of the Open Contracts recorded to an OSA (a “Partial Transfer”) in accordance with the provisions in Rule 10.7.6.

LME Clear shall designate one or more indicative Partial Transfer Windows (Batch Porting). When determining the duration and aggregate number of Partial Transfer Windows, LME Clear shall seek to identify the most favourable risk management solution, having regard to;

- the number of Clients allocated to the Relevant Accounts;
- the number, size and Market Value of the Open Contracts allocated to the Relevant Accounts; and
- the direction, size of the Position and overall risk profile of each Relevant Account.

Throughout the Default Period LME Clear shall have the right, having as its primary objective effective risk management, to vary the number and/or duration of the Partial Transfer Windows without prior notification.

LME Clear will transfer the requested positions subject to the conditions detailed in Rule 10.7.6 (d).

Any client submitting a Porting Request Notice must provide to LME Clear:

- A list of all Positions held in respect of that Client in the Client Account to which this Porting Request Notice relates; and
- Evidence of the authority of the signatory to this Porting Request Notice to sign this document on behalf of the Client.

LME Clear will provide details on the format of the position file required.

The porting request must also be approved and signed by the Transferee Member’s Authorised Signatory.

#### 4.4.4 Batch Porting

With respect to OSAs LME Clear will perform a batch process to ensure a fair process. The batch process will work as follows;

- if it is possible to port all clients in a batch in compliance with criteria defined as in accordance with the Rulebook, LME Clear will port all such clients;

- if it is not possible to port all clients in a batch in compliance with the general rule, LME Clear will pick the optimum porting combination amongst all such clients with the primary objective of effective risk management. Secondary objectives might also be considered here, for example porting the highest number of clients or the largest overall notional amount
- LME Clear will port that optimum combination and, thereafter, may hedge the remaining positions to the extent it considers it necessary to do so, which itself may allow others to port (or LME Clear may change any existing hedge positions which may also allow others to port);
- LME Clear will then consider the next batch which will comprise any clients who requested a port in a prior batch but which have not yet been ported and all other clients requesting partial porting within the timeframe applicable to the current batch;
- In certain pre-determined circumstances set out in Rule 10.7.6(f) (such as the need to manage risk optimally, a porting request from a client with a large book or a porting request from a client that might significantly reduce risk to LME Clear or permit a significant number of other clients to effect porting where they might not otherwise be able to), LME Clear would be permitted to process one or more client porting requests outside a predetermined batch

#### 4.4.5 Order of porting

On the day of default, LME will, in order of priority:

1. **In respect of ISAs and OSAs with Automatic Porting Documentation**, port all positions and collateral in ISAs and OSAs with Automatic Porting Documentation. This is an automatic process which is completed as soon as LME Clear receives consent from Transferee Clearing Member(s) to accept these accounts.
2. **In respect of ISAs without Automatic Porting Documentation**, process all Porting Requests from Identified Clients and port all positions and collateral to the nominated Transferee Clearing Member. LME Clear will also reasonably attempt to contact any other Identified Clients who have not contacted LME Clear to assess whether they have back up Clearing Members and will port to such nominated Clearing Members if conditions are met.
3. **In respect of OSAs without Automatic Porting Documentation where all Clients in such accounts request to port**, will process all Porting Requests from Identified Clients and port positions and collateral to the nominated Transferee Clearing Member. LME Clear will also reasonably attempt to contact any other Identified Clients who have not contacted LME Clear to assess whether they have back up Clearing Members and will port to such nominated Clearing Members if conditions met.
4. **In respect of OSAs without Automatic Porting Documentation where only some Clients request to port**, see Partial Porting section above.
5. **In respect of Non-Identified OSAs without Automatic Porting Documentation**, LME Clear will not have any details to contact these Clients. LME Clear will still consider all Porting Requests received within the Porting Period.

In the event of a default, LME Clear will immediately publish on its website details of the defaulting Clearing Member and contact details for LME Clear staff to whom Porting Requests should be made. The website will also include details of all the documentation necessary to port positions and collateral.

## 4.5 Hedging

A hedging and collateral liquidation strategy will be defined and agreed with the DMC for the house positions and also for the non-ported positions once these have been identified. This process may have to be undertaken more than once if material changes to the hedged positions occur e.g. if the porting of a large ISA account is refused by the receiving clearing member. .

LME Clear will assess the portfolio of the house account(s) and any positions in respect of clients that are not to be transferred to another non-defaulting Member. LME Clear has the right to take such steps as it considers are necessary or appropriate to reduce the exposure of the portfolio to minimise the risk that LME Clear may need to utilise any resources above the collateral available from the defaulting member.

LME Clear will utilise default brokers in order to facilitate the execution of any hedge trades and will endeavour to reduce the portfolio risk as far as practically possible to improve the chance of a successful auction process.

## 4.6 Default Auction

A default auction is expected to be held after hedging activities have reduced the risk exposure of the defaulting portfolio and the auction process shall apply in respect of any open contracts associated with it. LME Clear utilises a mandatory auction for Base and Precious services with separate processes and auctions for each service. The products of each service are not comingled and always will be separate from each other. LME Clear retains the discretion to determine the composition of each auction portfolio and the rules specify which members have an obligation to bid on each Auction Portfolio. Additionally, non-obligated members can still participate in an auction on a voluntary basis by notifying LME Clear that they wish to participate. If LME Clear decides to accept this request, such Members will be bound by the provisions in Default Procedure Part C 6.4 of the LME Clear Rules.

Due to the forward cash flow structure of the LME Base service, it is highly likely that an auction of the portfolio following the hedging process will be required to liquidate the remaining cash flows and any residual risk associated with open positions in the most efficient manner. Any auction process will be overseen by the DMC, and occur at a time judged by the DMC to be optimal to achieve the best possible price and to ensure maximum competitive participation by non-defaulting Members. An auction of the remaining open positions (which may include collateral, if appropriate) will be amongst non-defaulting members and LME Clear will prescribe such procedures for the conduct of the auction as it considers reasonably appropriate in the circumstances.

Non-defaulting Members required to bid on an auction portfolio will be given such opportunity as LME Clear will specify to evaluate the portfolios to be auctioned. All bids shall be made within such period as LME Clear will specify following the end of the evaluation period. LME Clear will specify the timing and process by which non-defaulting Members may provide bids. LME Clear will have discretion whether or not to accept a particular bid and, in so deciding, may take into account such factors as it considers appropriate.

### 4.6.1 Member participation criteria

As outlined in LME Clear Rulebook default procedure part C section 6.4, non-defaulting members that satisfy the entry criteria specified are subject to mandatory participation to evaluate the relevant

auction portfolio and submit a bid. A non-defaulting member will be required to participate in the auction of an auction portfolio where:

- It meets LME Clear's assessment of creditworthiness against a minimum credit rating.
- It is a participant in the individual service to which the open contracts in the relevant auction portfolio relates.
- It meets the criteria of historical positions in the open contracts included in the relevant service and auction (specified below).

In respect of the LME Precious service, LME Clear does not currently apply any criteria regarding the non-defaulting member's history of positions. Therefore no such criteria will be applied to justify any exclusion from participation.

However for the LME Base service, the criteria of historical positions relates to a non-defaulting member having held a position in respect of all underlying assets represented in the relevant auction portfolio within the 6 months immediately preceding the commencement of the relevant default period.

#### **4.6.1.1 Participation from the same group entity**

In the event that two or more non-defaulting members in the same group entity are mandated to participate in a default auction, each member within the same group entity must submit identical bids (see LME Clear Rulebook Annex 8 paragraph 10). If the bids are successful they must determine among themselves which member shall be treated as the winner of the auction that be required to pay for, and accept the auction Portfolio.

The other member is then treated as the non-successful bidder that was closest to the successful bid for the purpose of the application of the juniorisation (outlined in section 4.6.7). In the event where members in the same group entity fail to provide the notification required to allocate the winner, LME Clear will determine how the successful bid should be allocated between such members.

#### **4.6.1.2 Exclusion from participation**

Prior to any default period, non-defaulting members have the ability to request to be excluded from participation in any future auction on the grounds that they do not have the operational capability or capacity and expertise to participate in an auction. In doing so, they must provide a detailed explanation and, where appropriate, provide evidence to support their request. The member is required to inform LME Clear if its circumstances change in any way from the information provided in the request for exclusion.

If exclusion from participation is requested on grounds that a non-defaulting member or a related entity does not have the capability to manage its own positions, they must demonstrate that the following criteria are not being met:

- Regularly holding house account positions overnight in the underlying asset included in the auction portfolio.
- Client of the same member group regularly holds open positions overnight in the underlying asset included in the auction portfolio.
- Member regularly holds positions in any client account overnight in the underlying asset included in the auction portfolio (which in a default event of a client allocated to such client account, would result in the member needing to liquidate such positions).

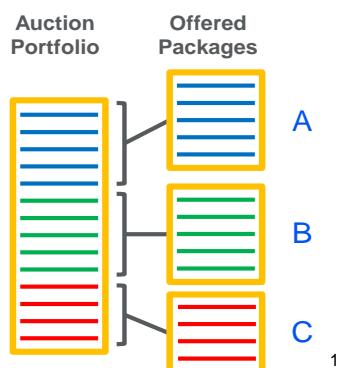
Additionally non-defaulting members can also request for exclusion on grounds that any applicable law binding them prohibits them from either participating in the auction or accepting the auction portfolio. Therefore such participation or acceptance would constitute a breach by the member of any applicable law binding on the member.

All requests for exclusion must be clearly articulated in writing with grounds based on one of the criteria specified in Annex 8 of the LME Clear Rules and signed by an authorised representative. Any agreement to such request shall be at LME Clear's discretion and approval from the DMC, with each exclusion request being reviewed annually.

In accordance with the rules, LME Clear also has the ability to exercise its discretion to exclude a member from participation in a particular auction taking into account the size of the auction portfolio, and/or whether the transfer of any auction portfolio to that member would be in excess of LME Clear's risk tolerance for that member. In such circumstances and prior to the disclosure of the default portfolio, notifications will be sent to the members during a default period that they are no longer mandated. Non-mandatory bidders may request to become voluntary bidders in accordance with Rule 6.5(e) and, provided that LME Clear accepts such request, such Members will be bound by the provisions in Default Procedure Part C 6.4 of the LME Clear Rules.

#### 4.6.1 Multi-Asset Auction

LME Clear has the ability to split defaulting portfolio to form multiple separate groups of positions as separate auctions, i.e. the Multi-Asset Auction approach for each product group services. The different auctions will only be grouped on a contract level with a single contract not being in multiple auctions. In practice, LMEC will aim to have the fewest number of auctions while maximising participation and limiting operational risk. An example of the default auction portfolio being split into separate auctions (packages) as below;



##### 4.6.1.1 Criteria of practice for splitting portfolio

LME Clear shall determine the composition of each Auction Portfolio, provided that an individual Auction Portfolio shall not contain Open Contracts relating to both the LME Base and LME Precious Services.. Prior to commencing an auction, LME Clear shall determine the proportion of each Member Default Fund Contribution that shall be attributable to each Auction Portfolio for the

---

<sup>1</sup> Default Risk Management Working Group (DRMWG), (2016) – Uniform CCP Terminology for Default Management Auctions

purposes of applying the juniorisation principles set out in Default Procedure C:6.6. For more detail see paragraph 4.6.1 below.

The DMC must agree on the composition of the defaulting portfolio to either split the positions using the multi asset auction approach or keep the overall portfolio composition unchanged. The auction of different portfolios may be conducted with the aim of ensuring an orderly process which protects the resources of LME Clear. The liquidity impact upon settlement of the auction will be considered with available liquidity managed accordingly to reflect this. Appendix C demonstrates examples of how a default portfolio could be split to form multiple auctions.

#### 4.6.2 The Auction process

Full details of the auction process are available in Annex 8 of the Rulebook. This includes details on the notification and noting members of their obligations under the Rulebook. A notice will be sent providing all timings of the auction and reminding members of the procedures to place their bids with reference to the GUI Guide, which has a step-by-step overview.

LME Clear will produce a file in a pre-agreed format, containing all positions to be included in the auction portfolio for the auction participants. LME Clear will document the price at which the positions will be transferred to the winning bidder. For forwards contracts, this will typically be at the original trade price, for options on forwards at zero. Where possible, for forward contracts the existing discounted CVM, and for options the NLV, will be included in the data sent to members.

Bids are in USD Cash only and will be communicated via the Default Auction screen functionality within LMEmercury. Bids are placed against either Pay or Receive and are from the clearing member perspective, i.e. Receive would mean the clearing member receives USD Cash from LME Clear. Bids can be placed as either negative or positive values to aid in the understanding of the bid from a clearing member perspective but this will be ignored by LME Clear and the bid only based on the 'Pay/Receive' instruction. Bidders can update their bid during the auction period, and members must honour their final bid made during the auction. Each auction will have one winner. Notification of whether the bid was successful or unsuccessful will be completed by LME Clear via email.

Please note:

- The winning bidder will have the full portfolio transferred into their House account
- A bid is valid only for the full portfolio
- The prices at which the positions will be transferred are show in the table below

Product	Price
Forwards	Original trade price
Futures	Previous day's closing price
Options	Zero price

The transfer of the positions will be performed within the clearing system once the auction is completed and therefore no trading or clearing fees are calculated.

#### 4.6.2.1 Auction timings

Indicative auction timings are;

Market	Auction Open	Auction Close	LMEC decision
Base	13:45	14:00	14:15
Precious	11:30	11:45	12:00

#### 4.6.3 Acceptance of the bid

LME Clear may accept the best price for the Positions subject to the auction that it believes accurately reflects the risk of the portfolio. LME Clear will have in place an appropriate process for determining an “acceptable auction price” which will consider the risks of the portfolio including: the current mark to market; the size of the auction portfolio relative to the market and the likely risk premium required by an auction participant.

LME Clear reserves the right to reject an auction bid from a Member if it deems the overall risk presented by the Member, following the transfer of any portfolio, to be in excess of LME Clear's risk tolerance for the Member or it considers that an auction bid does not fall within the 'acceptable auction price'.

If two or more Members submit a bid of the same value, LME Clear may, subject to its discretion to reject any bid, accept the bid which LME Clear considers represents the most favourable risk management solution. If LME Clear determines that bids could not be differentiated on risk management basis then winning additionally the time of submission could also be taken into account for bids of the same value. The final decision will be made by the DMC. The decision of LME Clear to accept or reject a particular bid will be conclusive and binding on all Members.

#### 4.6.1 Default Fund juniorisation

To incentivise competitive bidding, default fund juniorisation will be applied per auction with each participant's default contributions also allocated per each auction. However it will only become effective once losses exceed initial margin and it covers all losses that utilise the default fund, including losses during hedging activities. Where no auction is required losses will be assigned pro-rata. The steps outlined in the default fund juniorisation are in accordance with the Default Procedure C set out in the LME Clear rules.

##### 4.6.1.1 Allocation of default contribution per auction

The proportion of each non-defaulting member's default fund contribution attributed to an auction portfolio takes into account the member's total activity in the relevant service and the open contracts in the auction portfolio. Therefore, each member's average end of day initial margin (IM) as a percentage of their average overall initial margin (IM) within the 1 month immediately preceding the commencement of the relevant default period is utilised. The member default contribution per auction is then allocated based on the average IM for each underlying.

##### 4.6.1.2 Order of Default Fund juniorisation

The order of default fund juniorisation will be;

1. Ranked unsuccessful mandatory bidders (two-stage approach)

2. Ranked unsuccessful non-mandatory bidders (two-stage approach)
3. DMC rejected bids
4. LME Clear agreed exclusion – non participants
5. Winner
6. Excess contributions from other auction
7. Any remaining non-defaulting member contributions

These stages of the juniorisation are set out in more detail below.

#### 4.6.1.3 Two-stage approach

To recover losses from default fund contributions, a two stage approach is utilised on the ranked unsuccessful mandatory and the ranked unsuccessful non-mandatory bidders. The bidders will be ranked by dollar value, starting from zero (i.e. winner) with mandatory and non-mandatory bidders being ranked separately amongst themselves. In each case the rankings will be in ascending order so that the non-successful bidder closest to winner having a ranking of 1. Any mandatory and non-mandatory bidders who fail to submit a bid will be placed joint last behind the non-successful bidder furthest from the successful bid.

##### Stage 1:

Initially each bidder is ranked on dollar value away from the winner, then the rankings are utilised to calculate the member default fund contribution (DFC) at risk on the following basis;

$$\frac{R}{N} \times A = \text{Member DFC at risk}$$

Where:

"R" means the non-defaulting Member's ranking in the auction;

"N" means the number of non-successful bidders in the auction;

"A" means the Allocated DFC Amount.

Then each member default fund contribution at risk is used to calculate the actual contribution towards default loss. The amount of each Member's DFC at risk is applied against any remaining Default Loss (the "Amount Applied" or contributions at risk lost) will be calculated as follows:

$$\frac{TRDL}{TDFCR} \times MDFCR = \text{Amount Applied}$$

Where:

"TRDL" means the total remaining Default Loss (up to a maximum of all Member DFCs at risk);

"TDFCR" means the total of all Member DFCs at risk;

"MDFCR" means the Member DFC at risk.

If the recovered losses in stage 1 do not sufficiently cover the overall loss of the default fund and there are remaining contributions within the same auction, then stage 2 of the approach will need to be utilised.

##### Stage 2:

Any remaining member default fund contributions after the application of stage 1, shall be used on a pro rata basis, such as each member remaining default fund contribution will be applied towards the remaining default loss in the same proportion.

The table below demonstrates the Two-stage approach for a loss of default fund at \$50m. In the example below, only \$30.8mn can be recovered in Stage 1, therefore Stage 2 is required to recover the remaining losses. Evidently in Stage 1, depending on the order of ranking, default fund juniorisation is limited to the Member DFC at risk (i.e. Contributions at Risk in table below).

Loss of Default Fund		50,000,000	Stage 1						Stage 2			Overall	
Rank	Default Fund Contribution	Bid	Contribution at Risk (%)	Contribution at Risk (\$)	Contribution Lost (\$)	Contribution at Risk Lost (%)	Stage 1 Contribution Lost (%)	Contributions Left	Remainder of Contribution Lost (\$)	Remainder of Contribution Lost (%)	Overall Contributions Lost (\$)	Overall Contributions Lost (\$)	
Default	1,199,037	-	100%	1,199,037	1,199,037	100%	100%	-	-	0%	1,199,037	100%	
Winner	2,411,703	121,390,000	-	-	-	-	-	-	-	0%	-	0%	
1	13,699,002	122,440,000	10.0%	1,369,900	1,369,900	100%	10%	12,329,102	4,882,598	40%	6,252,498	46%	
2	23,571,391	122,840,000	20.0%	4,714,278	4,714,278	100%	20%	18,857,113	7,467,835	40%	12,182,113	52%	
3	8,213,479	123,210,000	30.0%	2,464,044	2,464,044	100%	30%	5,749,435	2,276,904	40%	4,740,947	58%	
4	6,147,896	123,220,000	40.0%	2,459,158	2,459,158	100%	40%	3,688,737	1,460,822	40%	3,919,980	64%	
5	11,281,428	123,520,000	50.0%	5,640,714	5,640,714	100%	50%	5,640,714	2,233,848	40%	7,874,562	70%	
6	1,000,000	123,520,000	60.0%	600,000	600,000	100%	60%	400,000	158,409	40%	758,409	76%	
7	1,000,000	124,010,000	70.0%	700,000	700,000	100%	70%	300,000	118,807	40%	818,807	82%	
8	4,997,932	125,130,000	80.0%	3,998,345	3,998,345	100%	80%	999,586	395,858	40%	4,394,204	88%	
9	4,767,669	125,830,000	90.0%	4,290,902	4,290,902	100%	90%	476,767	188,810	40%	4,479,713	94%	
10	3,379,731	126,050,000	100.0%	3,379,731	3,379,731	100%	100%	-	-	0%	3,379,731	100%	
Total	81,669,267			30,816,110	30,816,110			48,441,455	19,183,890		50,000,000		

#### 4.6.1.4 DMC rejected bids

In the event of the allocated default fund contributions per auction is not sufficient to cover the balance of the default loss by the two-stage approach on the mandated and non-mandated bidders, the allocated default contribution of any bidders whose bids in that auction were rejected by the DMC will be juniorised on a pro rata basis.

#### 4.6.1.5 LME Clear agreed exclusion

Any non-defaulting members that did not participate in the auction, and were not required to participate in the auction by any reason, will have their default fund contributions juniorised on a pro rata basis up to the remaining balance of the default loss.

#### 4.6.1.6 Excess contributions from other auctions

If the allocated default fund contribution amounts applied in the previous staged are not sufficient to discharge the balance of the default loss, then any default fund contributions of the bidders in the auctions of other auction portfolios relating to the same service that are remaining will be utilised.

In doing, each member's ranking across all other auction portfolio will be aggregated and then ranked with first ranking being the lowest aggregated ranking order. The mandatory and non-mandatory bidders shall be ranked together and any non-mandatory bidder in an auction being given a ranking of zero. Then each member additional default fund contribution (DFC) at risk is calculated based on the remaining default contributions from other auction portfolios, calculated as follows:

$$\frac{RO}{NO} \times AO = \text{Member Additional DFC at risk}$$

Where:

"RO" means the Member's ranking across all other Auction Portfolios;

"NO" means the number of bidders across all other Auction Portfolios;

"AO" means the sum of the Member's remaining Allocated DFC Amounts for all other Auction Portfolios.

Once each member's additional default fund contribution at risk from other auctions is identified, the amount to be applied against any remaining default loss will be calculated as follows:

$$\frac{\text{TRDL}}{\text{TADFCR}} \times \text{ADFCR} = \text{Additional Amount Applied}$$

Where:

"TRDL" means the total remaining Default Loss (up to a maximum of all Member Additional DFC's at risk);

"TADFCR" means the total of all Member Additional DFC's at risk;

"ADFCR" means the Member Additional DFC at risk.

Appendix A demonstrates an example for the LME Precious service and how the ranking of individual auctions can be combined to utilise excess contributions.

#### 4.6.1.7 Any remaining non-defaulting member contributions

If the allocated default fund contributions applied in the previous stages of the juniorisation process are not sufficient to cover the balance of the default loss, any remaining default fund contributions of the non-defaulting members will be utilised on a pro rata basis such that the same proportion will be applied towards the default loss.

#### 4.6.2 Payment process

Payments resulting from the auction process will be made via the Secure Payment System. LME Clear will transfer the purchased positions at the pre-defined price to the successful bidder. Where any amount is payable by LME Clear to the successful bidder, LME Clear will not be obliged to make such payment until after the positions have been transferred to the successful bidder.

#### 4.6.3 Failed Auction

Where LME Clear determines that either there is insufficient participation in the auction or where the bid(s) received are not deemed by LME Clear to be reflective of the risks in the auction portfolio, LME Clear will deem an auction to be a "Failed Auction". LME Clear may undertake one or more further auctions. LME Clear may adjust the parameters of the new auction in order to increase the likelihood of achieving successful bids (for example, by adjusting the risk profile of the auction portfolios (by hedging), or their size (by splitting the portfolios by contract/maturity). There is no limit to the number of auctions that LME Clear may conduct.

In the event that LME Clear does not consider that a further auction would be successful, it may seek to close-out the remaining Open Contracts of the Defaulting Member through voluntary and then mandatory cash settlement with non-defaulting Members and realise any potential profit or loss.

In the event that LME Clear applies cash settlement, LME Clear shall:

- Consult with the Board Risk Committee on its proposals to do so, which shall include providing an explanation of the steps LME Clear proposes to take in relation to such cash settlement and its rationale for taking such steps; and

- Effect such cash settlement at the then prevailing market price for the underlying assets or, if such market price is not available, at such price as LME Clear determines is reasonably appropriate in the circumstances in consultation with the Board Risk Committee.

## 4.7 Default Fund replenishment and stabilisation fund

### 4.7.1 Replenishment

All clearing members and LME Clear are required to replenish the default fund once in the event that all funded default fund contributions are exhausted, upon the publication of a Default-Specific Replenishment Notice. With the introduction of LMEprecious and separate default funds, the replenishment of each fund will occur independently for each service.

- The replenishment amount required by all members will be up to each members default fund contributions immediately prior to the default period.
- LME Clear will make available another 25% of its regulatory capital requirement.

All additional non-defaulting member contributions and the LME Clear contribution will be utilised as a single amount and losses shared on a pro-rata basis - that is, taking the proportion by which each non-defaulting member's, or LME Clear's, contribution bears the aggregate amount of the total default fund contributions immediately following replenishment.

In any six month period the maximum amount that LME Clear may require any Member to contribute shall be limited to the amount that would be recoverable under three Default-Specific Replenishment Notices.

If the replenishment funds are depleted then a decision will be made into whether VM haircutting is required.

### 4.7.2 Stabilisation Fund

LME Clear has to ensure that it continues to meet regulatory requirements in terms of resources to cover any future defaults. A stabilisation fund will be required from clearing members so a fund is in place for a further default. Note that these further funds cannot be used for the existing default.

The value to be received from each clearing member will be up to the maximum contribution previously paid.

## 4.8 VM Haircutting

If the financial resources available to LME Clear in a default, including the replenishment provisions, are not sufficient to discharge the loss incurred then the LME Rulebook (10.10.2) states that LME Clear would notify members of the need to introduce a VM haircut. Where LME Clear incurs a loss the haircut would be on VM profits

This is the process by which LME Clear would impose a haircut on cumulative variation margin is;

- USD cash is requested from the clearing member accounts where profits were made on the previous business day.
  - For Contingent Variation Margin (CVM) contracts this will be where the change in CVM is a gain.

- For Futures this will be the daily positive realised VM
- For Options this will be the daily gain in NLV
- For CVM, even though the profit is contingent and not due to be realised until prompt date, this will result in a USD cash call immediately. This is because LME Clear will realise the profit at the point the portfolio is sold, i.e. in the Auction.
- The assignment of the loss to profit makers will be done pro-rata to their share of total profits.
- This will be performed at a member account level, regardless of the metal or products in which any loss was incurred.
- It will be an end-of-day to end-of-day calculation based on the defined closing prices
- Therefore this will only impact accounts which make an overall net profit on that day.
- It is calculated on the day any loss is incurred by the CCP to prevent the CCP being in a potential default state itself

Examples are available in Appendix B.

VM haircutting will continue until the loss is fully covered or the LME Clear Board, following consultation with the Board Risk Committee, decides that it should end and LME Clear should move to the next stage of the waterfall, as described in the same section of the Rulebook.

## 5 Post Default

After the end of the Default Period LME Clear shall, between the second and the sixth business days following the end of the Default Period recalculate the size of the Default Fund and notify each Member informing them of their revised Default Fund Contribution.

The Default Fund and member contributions calculation runs on a daily basis and so members can view the size of their contribution should the fund be recalculated.

Clearing members can choose to continue membership or terminate by lodging a Resignation Notice. Full details are provided in the Rulebook, Rule 10.

## 6 Two Member Default

In the event of a second member being declared in default during the period of the first member default not being complete, LME Clear may wish to manage the exposure across portfolios. This is in essence a similar hedging process as described in section 5.5, however in this case it may be between the two House accounts rather than a House and a client account. Where positions are to be hedged across accounts they will need to be maintained within the existing portfolios to ensure the correct allocation of costs and to meet regulatory requirements. Given the exposures of individual member accounts can be tracked it will be possible to auction portfolios of 2 members combined and allocate costs to each accordingly (see section 8.4).

## 7 Appendix A: Default fund contribution example of multiple auction

If further contracts are introduced to the precious service, ranking of more than 2 auctions could be combined. The example outlined in this Appendix covers a 3 auction setup. Default contributions will continue to be split for each contract. Excess contribution of each auction will be calculated and rankings of auctions with an excess are combined to create an overall rank. Combined excess is then utilised to cover losses based on combined ranking (high to low). Where rankings are equal contributions, it will be dollar for dollar. The tables below demonstrate an example with member FFF defaulting and ignoring SITG which will normally be factored in. The cost to auction 3 is greater than all contributions to that auction, but only part of contributions to 1 and 2 are used. Therefore the excess from auction 1 and 2 can be used to cover costs and losses in auction 3.

Member	DF Auction 1			DF Auction 2			DF Auction 3		
	Contribution	Utilised	Excess	Contribution	Utilised	Excess	Contribution	Utilised	Excess
AAA	2,000,000	-	2,000,000	1,000,000	-	1,000,000	500,000	500,000	-
BBB	615,385	500,000	115,385	384,615	-	384,615	300,000	300,000	-
CCC	833,333	-	833,333	666,667	-	666,667	750,000	750,000	-
DDD	1,500,000	1,500,000	-	900,000	500,000	400,000	1,200,000	1,200,000	-
EEE	2,177,778	-	2,177,778	622,222	-	622,222	350,000	350,000	-

Member	DF Auction 1	DF Auction 2	Combined
AAA	2	4	6
BBB	4	1	5
CCC	1	3	4
DDD	5	5	10
EEE	3	2	5

## 8 Appendix B: Variation Margin Gains Haircutting examples

In the following examples CCC clearing member is the defaulting member and where losses are incurred.

### Example 1

This example shows the overall variation margin and how the loss of the defaulting member is distributed across those with VM profits, based on a proportion of overall profits to cover the loss on the defaulters account.

		Loss	-5,000,000.00
CCC in default			
Account	VM	Profits	VM Haircut
AAA_C_CLIENT	7,500,000.00	7,500,000.00	-2,343,750.00
AAA_H_1	500,000.00	500,000.00	- 156,250.00
BBB_C_CLIENT	-2,000,000.00	-	-
BBB_H_1	1,000,000.00	1,000,000.00	- 312,500.00
CCC_H_1	-5,000,000.00	-	-
DDD_C_CLIENT	- 500,000.00	-	-
DDD_H_1	-3,500,000.00	-	-
EEE_C_CLIENT	4,000,000.00	4,000,000.00	-1,250,000.00
EEE_C_CLIENT2	3,000,000.00	3,000,000.00	- 937,500.00
EEE_H_1	-5,000,000.00	-	-

Each account may have profits and losses per contract, these are netted to calculate the overall VM per account.

Account	Contract	VM
AAA_C_CLIENT	AHD	2,500,000.00
AAA_C_CLIENT	CAD	8,500,000.00
AAA_C_CLIENT	NID	1,000,000.00
AAA_C_CLIENT	PBD	- 3,000,000.00
AAA_C_CLIENT	ZSD	- 1,500,000.00
AAA_C_CLIENT	Total	7,500,000.00

### Example 2

This example shows the impact of having multiple types of variation margin.

				Loss	-4,900,000.00
CCC in default					
Account	Change in CVM	RVM	Total VM	Profits	VM Haircut
AAA_C_CLIENT	7,500,000.00	1,000,000.00	8,500,000.00	8,500,000.00	-2,570,987.65
AAA_H_1	500,000.00	- 250,000.00	250,000.00	250,000.00	- 75,617.28
BBB_C_CLIENT	- 2,000,000.00	500,000.00	- 1,500,000.00	-	-
BBB_H_1	1,000,000.00	250,000.00	1,250,000.00	1,250,000.00	- 378,086.42
CCC_H_1	- 5,000,000.00	100,000.00	- 4,900,000.00	-	-
DDD_C_CLIENT	- 500,000.00	500,000.00	-	-	-
DDD_H_1	- 3,500,000.00	- 1,000,000.00	- 4,500,000.00	-	-
EEE_C_CLIENT	4,000,000.00	- 600,000.00	3,400,000.00	3,400,000.00	-1,028,395.06
EEE_C_CLIENT2	3,000,000.00	- 200,000.00	2,800,000.00	2,800,000.00	- 846,913.58
EEE_H_1	- 5,000,000.00	- 300,000.00	- 5,300,000.00	-	-

### Example 3

This example shows that where this is required over multiple days, each day is a separate calculation. Therefore clearing members may be impacted on one or multiple days depending on when they make VM profits.

CCC in default	Day 1			Day 2		
	VM	Profits	VM Haircut	VM	Profits	VM Haircut
AAA_C_CLIENT	7,500,000.00	7,500,000.00	-2,343,750.00	- 500,000.00	-	-
AAA_H_1	500,000.00	500,000.00	- 156,250.00	1,000,000.00	1,000,000.00	- 312,500.00
BBB_C_CLIENT	-2,000,000.00	-	-	3,000,000.00	3,000,000.00	- 937,500.00
BBB_H_1	1,000,000.00	1,000,000.00	- 312,500.00	-1,500,000.00	-	-
CCC_H_1	-5,000,000.00	-	-	-2,000,000.00	-	-
DDD_C_CLIENT	- 500,000.00	-	-	600,000.00	600,000.00	- 187,500.00
DDD_H_1	-3,500,000.00	-	-	4,200,000.00	4,200,000.00	-1,312,500.00
EEE_C_CLIENT	4,000,000.00	4,000,000.00	-1,250,000.00	-2,800,000.00	-	-
EEE_C_CLIENT2	3,000,000.00	3,000,000.00	- 937,500.00	1,000,000.00	1,000,000.00	- 312,500.00
EEE_H_1	-5,000,000.00	-	-	-3,000,000.00	-	-

## 9 Appendix C: Examples of splitting auction portfolio

### 9.1 Example 1 – Splitting the portfolio

- Portfolio consists of the main contracts, Cobalt and Aluminium Alloy.
- Total requirement: \$72.6mn

Contract	IM	CVM
Aluminium Alloy (AA)	30,000	205,000
Aluminium HG (AH)	40,000	- 8,635,000
Copper (CA)	65,000	- 18,500,000
Cobalt (CO)	22,500	625,000
Nickel (NI)	43,500	- 22,000,000
Lead (PB)	37,500	- 9,850,000
Zinc (ZS)	29,500	- 14,750,000
<b>Total</b>	<b>268,000</b>	<b>- 72,905,000</b>

- DMC decision;
  - o DMC preference to split portfolio to hold 3 auctions; CO and AA to be auctioned off separately.

### 9.2 Example 2 – Splitting the portfolio

- Portfolio consists of the main contracts.
- Total requirement: \$0mn (excess credit CVM of \$409.8).
- Winner of auction to pay close to \$409.8mn for the locked in profits.

Contract	IM	CVM
Aluminium HG (AH)	28,000	123,000,000
Copper (CA)	43,000	156,500,000
Nickel (NI)	75,000	48,000,000
Lead (PB)	10,500	24,850,000
Zinc (ZS)	57,000	57,700,000
<b>Total</b>	<b>213,500</b>	<b>410,050,000</b>

- DMC decision:
  - o Split portfolio into 3 auctions – 1) AH, 2) CA, 3) NI, PB and ZS.

### 9.3 Example 3 – Splitting the portfolio

- Portfolio consists of the main contracts, Aluminium Alloy (AA) and NASAAC (NA);
- Total requirement: \$0mn (excess credit CVM of \$273.7)
- Winner of auction to pay close to \$273mn for the locked in profits.

Contract	IM	CVM
Aluminium Alloy (AA)	30,000	1,105,000
Aluminium HG (AH)	62,500	- 255,000,000
Copper (CA)	78,500	183,500,000
NASAAC (NA)	22,500	1,625,000
Nickel (NI)	33,500	126,500,000
Lead (PB)	28,500	48,300,000
Tin (SN)	32,500	24,750,000
Zinc (ZS)	46,000	143,300,000
<b>Total</b>	<b>334,000</b>	<b>274,080,000</b>

- DMC decision:
  - o Excess CVM will be reduced to \$90.5mn once Copper is separated out.
  - o Split portfolio into 3 auctions – 1) AA, 2) CA, 3) AH, NA, NI, PB, SN and ZS