

LCH.Clearnet SA Cash Equity

Additional margin: Liquidity & Concentration Risk Margin Principles

9th of May 2014

- Subject to final internal approval -

Members will be informed of final date and methodologies in due time.

Contents

1. Definition and scope
2. Margin Calculation Principles & Methodology
3. LCRM Margins calls
4. Cash Equities – Treasury Report

1 Definition and scope

➤ Liquidity and Concentration Risk Margin (LCRM)

LCRM is to cover the risk generated by the inability to neutralise a Clearing Member concentrated or illiquid position within **the standard** Holding Period in **Business As Usual** (BAU) market conditions.

➤ This risk is mitigated by comparing:

- ✓ The Clearing Member's positions with the **Market Daily Average Traded Volume (MDATV)** of the underlying asset,
- ✓ Additional margin requirements calculated to cover this specific exposure

➤ Products' scope for Cash Equities:

- ✓ All eligible assets cleared (equities, warrants, trackers, funds...)
- ✓ Bonds are not in the scope for the time being.

2. Margin Calculation Principles & Methodology

- **The main principle** is to compare the Member position with the **Market Average Daily Traded Volume (MADTV)** of underlying assets

 - **The methodology**
 - ✓ assess the number of days required to liquidate this position without generating any market abnormal movements .
 - ✓ Assumption: using **25% of the MADTV** that could be traded on the market on a daily basis, considering a 60 business days look up period.

 - **The margin calculation considers**
 - ✓ the potential **required delay** to liquidate the concentrated position on an asset
 - ✓ specific risk parameters used in SPAN[®] methodology for the **Initial Margin (IM)** calculation.
- For each concerned position, at the Clearing Member **Collateral Accounts' level**, a LCRM **calculation** is performed.

2. Margin Calculation – Formulas for House Compartment

✓ **IF** the potential required delay of the **net** position exceeds the standard Holding Period (3 days), it is flagged as concentrated or illiquid position (i.e. when the net position > standard HP x 25% x MADTV).

✓ For each position, a new Holding Period (HP^{New}) is defined as below, for each ISIN (Trading Code of the product):

$$HP^{New} = \text{Max} \left(\frac{|Net\ Position|}{25\% \times MADTV}, HP^{Standard} \right)$$

The new Holding Period (HP^{New}) is then utilized in the LCRM calculation at **ISIN level (and per Collateral Account)** as shown below:

$$LCRM_{House}^{Isin\ i} = \text{Max} \left(\frac{X_{LiQ}}{1.25} \times |Net\ Valued\ Position| \times \left(\sqrt{\frac{HP^{New}}{HP^{Standard}}} - 1 \right) - Buffer_{NR}; 0 \right)$$

Where

$\frac{X_{LiQ}}{1.25}$	is the Specific Risk parameter of the underlying asset liquidity class, reduced from the 25% additional EMIR buffer used in the parameter calibration.
Net Position	is the net number of shares on the underlying asset
Net Valued Position	is the net valued position on the underlying asset, being the Net Position multiplied by the last Clearing Price
MADTV	is the average daily traded volume (number of shares), over 60 business days , of the underlying asset.
$HP^{Standard}$	is set to 3 days as of August 2013
$Buffer_{NR}$	is the Negotiation Risk Buffer corresponding to the liquidity add-on of the Negotiation Risk, as defined in the SPAN Cash algorithm.

2. Margin Calculation - Holding Period Caps

➤ Holding Period Cap

- ✓ The new Holding Period* is capped:

Type of Position	Caps
for Long positions on the ISIN	10 days
for Short positions on the ISIN	5 days

- ✓ Aggregated LCRM is calculated at Clearing Member level and is based on the sum of LCRMs from each individual ISIN level.
- ✓ This calculation is done at House level as per the formula below and at Client level compartments **separately** (for client compartment calculation please refer to slides 6-7-8).

$$LCRM_{House} = \sum_{All\ Isins} LCRM_{House}^{Isin\ i}$$

* Parameters will be reviewed at least annually

2. Margin calculation – Formulas for Client Compartment 1/3

As per EMIR Segregation principles, Positions and Risk Exposure are segregated depending on the account structure.
→As a result the Long and Short positions across all ISA/OSA's need to be assessed independently, as detailed below:

➤ **Positions should be netted by ISIN across ISD (Intended Settlement Day) at ISA and /or OSA level**

- ✓ The Long net positions across all ISA/OSA's should be summed by ISIN across ISD and assessed against the MADTV
- ✓ The Short net positions across all ISA/OSA's should be summed by ISIN across ISD and assessed against the MADTV

➤ A **new holding period (HP^{New})** is calculated for any flagged long and short positions independently

- ✓ A LCRM should be calculated independently for any flagged long and short positions with the new Holding Period.

$$HP_{Long\ Isin\ i}^{New} = \text{Max} \left(\frac{\sum_{All\ ISA/OSA} \text{Long Net Position}}{25\% \times MADTV}, HP^{Standard} \right)$$

$$HP_{Short\ Isin\ i}^{New} = \text{Max} \left(\frac{\sum_{All\ ISA/OSA} \text{Short Net Position}}{25\% \times MADTV}, HP^{Standard} \right)$$

2. Margin calculation – Formulas for Client Compartment 2/3

➤ The HP^{New} is used in the overall LCRM calculation for long and short positions across all ISA /OSA which is applied at the ISIN level

$$LCRM_{All\ ISA/O SA}^{Long\ Isin\ i} = Max \left(\frac{X_{LiQ}}{1.25} \times |Valued\ Long\ Position| \times \left(\sqrt{\frac{HP_{Long\ Isin\ i}^{New}}{HP^{Standard}}} - 1 \right) - Buffer_{NR:0} \right)$$

$$LCRM_{All\ ISA/O SA}^{Short\ Isin\ i} = Max \left(\frac{X_{LiQ}}{1.25} \times |Valued\ Short\ Position| \times \left(\sqrt{\frac{HP_{Short\ Isin\ i}^{New}}{HP^{Standard}}} - 1 \right) - Buffer_{NR:0} \right)$$

Where

$\sum_{All\ ISA/O SA} Long\ Net\ Position$ and $\sum_{All\ ISA/O SA} Short\ Net\ Position$ are respectively the long and short numbers of aggregated shares across all ISA/OSA's

Valued Long Position and **Valued Short Position** are respectively the long and short valued position on the asset, across all ISA/OSA's, being the whole Long and whole Short.

2. Margin calculation – Formulas for Client Compartment 3/3

- The LCRM, for a given ISIN, is then expressed at individual ISA/OSA's level, based on the prorate of its long and short positions as below

$$LCRM_{each\ ISA/OSA}^{Isin\ i} = Ratio_{Long}^{Isin\ i} \times LCRM_{All\ ISA/OSA}^{Long\ Isin\ i} + Ratio_{Short}^{Isin\ i} \times LCRM_{All\ ISA/OSA}^{Short\ Isin\ i}$$

Where

$Ratio_{Long}^{Isin\ i}$ is the long net position of the individual ISA/OSA on the Isin i, divided by the sum of all the long positions across all ISA/OSA's on the Isin i.

$Ratio_{Short}^{Isin\ i}$ is the short net position of the individual ISA/OSA on the Isin i, divided by the sum of all the short positions across all ISA/OSA's on the Isin i.

- The resulting LCRM at ISA/ OSA level is expressed in the formula below:

$$LCRM_{Individual\ ISA/OSA} = \sum_{All\ Isins} LCRM_{Individual\ ISA/OSA}^{Isin\ i}$$

3. LCRM Margins calls

➤ Monthly LCRM:

- ✓ The monthly LCRM is based on **the LCRM daily average of the previous month** (including all business days)
- ✓ It will be effectively called if its amount is **positive and above** the materiality threshold.
- ✓ The monthly LCRM is called the same day as the Default Fund contribution: **4th business day of the month**

Monthly LCRM Threshold = 100k€

➤ Daily LCRM:

- ✓ The Additional Margin due to LCRM is calculated daily based on the previous COB positions.
- ✓ When the daily uncovered LCRM exceeds the last month LCRM + a daily LCRM materiality threshold, then a daily additional margin requirement is performed:
 - ✓ If $(\text{Daily LCRM Calculation} - \text{LCRM}_{\text{latest month}}) > \text{Daily LCRM Threshold} \Rightarrow$ the difference is called as additional daily LCRM to mitigate such uncovered risk
 - ✓ If $(\text{Daily LCRM Calculation} - \text{LCRM}_{\text{latest month}}) < \text{Daily LCRM Threshold} \Rightarrow$ no additional Daily LCRM is required

Daily LCRM Threshold = Min [5Mln€; Max(10% x Daily Initial Margin ; 100k€)]

➤ Timing and treasury report:

- ✓ The LCRM call (monthly or daily one) is done during the regular intraday margin call.
- ✓ The LCRM amount will be visible under the 'Additional margins' tab of the AC102E treasury report.

Note: Thresholds are parameters which will be reviewed at least annually.

4. Cash Equities – Treasury Report

- The LCRM amount will be visible under the 'Additional margins' tab of the AC102E treasury report as displayed below:

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1 CODE ETAT : AC0102E      BANQUE CENTRALE DE COMPENSATION DITE LCH.CLEARNET SA - 18 RUE DU QUATRE SEPTEMBRE 75002 PARIS
                           BANQUE CENTRALE DE COMPENSATION DITE LCH.CLEARNET SA - 18 RUE DU QUATRE SEPTEMBRE 75002 PARIS
                                                                                                     PAGE      1
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                           DOCUMENT APPEL DE FONDS VALEURS MOBILIERES EN EUR - INITIAL
                           CASH SECURITIES CASH CALL DOCUMENT IN EUR - INITIAL
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ADHERENT      / MEMBER      : TOTO CLIENT                               DATE DE VALEUR/VALUE DATE      : 21/10/2013
CODE MEMBRE   / MEMBER CODE : A0034                               DATE DE BOURSE/TRADING DATE    : 18/10/2013
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	S/Cpte M House S-Acc	S/Cpte T Market Maker S-Acc	S/Cpte C Client S-Acc	TOTAL TOTAL
(D) ---> FLUX DIVERS / VARIOUS FLOW				

PENALITE / PENALTY	0,00C	0,00C	0,00C	0,00C
TVA PENALITE / PENALTY VAT	0,00C	0,00C	0,00C	0,00C
RACHAT TITRE / REPURCHASE OF SECURITIE	0,00C	0,00C	0,00C	0,00C
ANNUL SUSPENS TIT. / FAILS CANCEL. SECURITIE	0,00C	0,00C	0,00C	0,00C
REGUL CHAMBRE COMPENS./ REGUL. CLEARING HOUSE	0,00C	0,00C	0,00C	0,00C

	0,00C	0,00C	0,00C	0,00C (D)
(N) ---> FLUX GARANTIE / COLLATERAL FLOW				

COUVERTURE EXIGEE RISQUE LIQUIDATION / LIQUIDATION RISK	0,00C	0,00C	723.989,62D	723.989,62D
COUVERTURES ADDITIONNELLES (DEFAULT FUND) / ADDITIONAL MARGINS (DEFAULT FUND)	0,00C	0,00C	0,00C	0,00C
COUVERTURE EXIGEE RISQUE NEGOCIATION / NEGOCIATION RISK	0,00C	0,00C	17.754,75D	17.754,75D
COUVERTURE PRET/EMPRUNT BRUXELLES / L&B BRUSSELS RISK	0,00C	0,00C	0,00C	0,00C
MAJORATION DE COUVERTURE / INCREASE COVERAGE	0,00C	0,00C	0,00C	0,00C
MARGES ADDITIONNELLES / ADDITIONAL MARGINS	0,00C	0,00C	0,00C	0,00C
TOTAL COUVERTURE EXIGEE JOUR / TOTAL MARGIN REQUIREMENTS	0,00C	0,00C	741.744,37D	741.744,37D

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