| LCH The Markets' Partner<br><br>Instruction | N° | Title |
|---|---|---|
| | IV.2-1 | **MARGIN REQUIREMENTS FOR TRANSACTIONS ON SECURITIES TRADED ON A CASH MARKET OPERATED BY A MARKET UNDERTAKING.** |

***Pursuant to Chapter 2 of Title IV of the Clearing Rule Book.***

For any information regarding Margins payment arrangement, Collateral accepted and cash payments please refer to Instruction IV.4-1.

## CHAPTER 1 SCOPE

Article 1

This Instruction describes the method for calculating Margin requirements and payment obligations, as well as the means to fulfil these requirements for Transactions on Securities registered in Cash & Derivatives Clearing System.

LCH SA informs Clearing Members of the amount relative to the Margins requirement during the day of the payment of the Margin.

LCH SA calculates Margin requirements several times a day as set out in a Notice.

For the avoidance of doubt, the provisions of this Instruction shall also apply to the Transactions on Securities registered in the Clearing System and resulting from the Exercise or Assignment of option contracts or from the expiry of futures contracts, which involve the physical settlement of such underlying Security.

## CHAPTER 2 CALCULATION METHODOLOGY

### *Section 2.1 Initial Margin and total Initial Margin*

Article 2 – General Provisions

The Margins requirement for the liquidation risk are calculated using an algorithm specific to Securities market (stocks and bonds), and as described below

LCH SA calculates margins in order to cover the liquidation risk that it bears regarding the Open Positions in case of an Event of Default.

This risk is calculated each Clearing Day per Clearing Member, per currency, at the Margin Accounts level.

The detailed methodology is available on LCH SA web site.

Article 3 – Initial Margin

The Initial Margin covers the potential adverse movements in the risk factors such as Security price and FX (foreign exchange) rate, in a confidence level defined by LCH SA and published on the website.

The Initial Margin calculation is based on the following methodologies as published on the website in the secure area:

- A value at risk (VaR) measure based on the historical VaR and expected shortfall, both including a decorrelation risk measure and a diversification cap;
- A pool margin measure applied to the Securities with less historical data or special characteristics, based on bucket classes as specified in a Notice.

LCH SA inputs parameters and historical data into the Initial Margin model which are either provided in Notice or in technical files. The values of these parameters and historical data are determined by LCH SA according to the risk level against which LCH SA intends to protect itself.

Article 4 - Total Initial Margin

The "total Initial Margin" intends to cover all the potential future price fluctuations in case of unfavourable markets movements in different circumstances.

It consists of four components covering the liquidation risk:

- The Initial Margin;
- The following other Margins:
  - The wrong way risk Margin to cover the contagion effect of a default on the financial sectors;
  - The event risk acting as floor to the aggregated Initial Margin and wrong way risk Margin, to cover idiosyncratic risk;
  - The self-referencing risk Margin to cover the self-referencing risk that would arise in case of a Clearing Member being declared in default and has a buyer exposure on its own group Securities.

LCH SA inputs parameters and historical data into the risk models which are either provided in a Notice or in technical files. The values of these parameters and historical data are determined by LCH SA according to the risk level against which LCH SA intends to protect itself.

***Section 2.2 Contingency variation Margin and final Initial Margin requirement***

Article 5 – Contingency variation Margin

LCH SA calculates the "contingency variation Margin" it bears regarding Open Positions which are not yet settled.

This calculation is made each Clearing Day per Clearing Member, per Security, at Margin Account level.

The "contingency variation Margin" is the difference between the buying or selling Open Positions revalued at a reference price and the Open Positions on Securities valued at the trading price (including a price issued from Exercise and/or Assignment of option contracts or expiry of future contracts) and reflects the loss or the gain that would be caused by the complete liquidation of the Open Positions according to the market conditions at the last reference price, whereas the future risk is being covered by the "total Initial Margin" (as described above).

This calculation is executed for each Security, in the currency in which such Security is cleared.

Article 6 – Final Initial Margin requirement

The "final Initial Margin requirement" is the sum of the "contingency variation Margin" and the "total Initial Margin". If the "contingency variation Margin" is a credit, offsets are provided in the limit of the "total Initial Margin" excluding the self-referencing risk.

## CHAPTER 3 ADDITIONNAL MARGINS

In addition to the Margins calculated and called pursuant to Article 4.2.0.1 of the Rule Book and related Instructions, LCH SA may call for additional Margins pursuant to Article 4.2.0.3 of the Rule Book. Parameters and Margin call principles relating to additional margins are set forth in a Notice.

LCH SA compares the amount of Margins requirement to the amount of the latest Margin call. It then performs the following process:

If the Margins requirement is greater than the value of the Collateral deposited, a call for covering this requirement is made.

If the Margins requirement is lower than the value of the Collateral deposited, refunds are made according to the conditions and timetable set forth in a Notice.

## CHAPTER 4 INTRA-DAY MARGINS

Pursuant to Article 4.2.0.2 of the Rule Book, Intra-day Margins calculation is performed several times per Clearing Day in the course of Intra-day Margin calculation sessions, and consists in calculating Intra-day Margin requirement based on re-evaluated Clearing Members' Open Positions and real-time prices. This calculation process may result in an Intra-day Margin call in the conditions described in this Instruction and related Notice.

Each Intra-day Margin calculation session is qualified as either "With Margin call" or "Without Margin call" as set-up in a Notice.

In any event, there is at least one "With Margin call" Intra-day session per Clearing Day. However, LCH SA can as it deems necessary re-qualify any "Without Margin call" sessions into "With Margin call" sessions or the other way around.

A "With Margin call" session implies that for each Clearing Member LCH SA compares the amount of Intra-day Margin requirement to the amount of the latest Margin call.

LCH SA proceeds to the following calculations for each Clearing Member:

**1 – Calculation of Open Positions per Margin Account**

LCH SA performs snapshots on Open Positions, where

each Open Position is valued, applying the real time prices where available or using the last reference price. If the last reference price is unknown, LCH SA will use the last known price. The price used is hereinafter referred to as the "New Reference Price".

**2 – Intra-day Margins calculation**

Based upon these Open Positions valuation, LCH SA calculates the "final Initial Margin requirement" as described in Article 6 above and some additional margins as set out in a Notice.

These Margins are calculated applying the same methodologies as described under Chapter 2 of this Instruction and using the New Reference Price.

LCH SA compares the amount of Intra-day Margin requirement to the amount of the latest Margin call. It then performs the following process:

- For each Clearing Member (at Collateral Account level) for which:

latest Margin call < latest Intra-day Margin requirement

LCH SA values the amount of available Collateral and compares such amount to the amount of the latest Intra-day Margin requirement.

And then,

- For each Clearing Member (at Collateral Account level) for which as a result of such comparison it appears that:

  available valued Collateral < Intra-day Margin requirement

LCH SA actually performs an Intra-day Margin call amounting to the difference between the Intra-day Margin requirement and the available valued Collateral.

**3 – Collateral valuation**

There is at least one Intra-day Margin calculation session “With Margin call” per day, where Collateral is valuated. The details of the Collateral valuation schedule are set out in a Notice.