EURONEXT CLEARING

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Commodity Derivatives Risk Engine: Total Margins

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METHODOLOGICAL NOTES

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1 Introduction

This document illustrates the computation of the Total Margins requirement for the Clearing Member's portfolio (i.e. margin account), once all the various margin components described in the other modules have been computed.

In particular, the following margin components are required in order to compute the Total Margins:

1) *Mark-to-market Margins* – MtmM;
2) *Initial Margins*, *Ordinary* (scaled) and *Stressed* (unscaled) – $IM_{ordinary}$ and $IM_{stressed}$;
3) *Decorrelation risk add-on*, *Ordinary* and *Stressed* – $DECO_{ordinary}$ and $DECO_{stressed}$;
4) *Liquidity risk add-on* – LIQ;
5) *Concentration risk add-on* – CONC;
6) *Settlement risk add-on* – SETTL.

2 *Total Margins* requirement computation

The Total Margins (TM) requirement for a given portfolio (Clearing Member's margin account) is given by:

$$\text{TM} = max\{TM_{SUB1} + TM_{SUB2} + LIQ + CONC; 0\} + SETTL + TM_{SUB3},$$

or, put differently:

$$\text{TM} = max\{TM_t; TM_{t+1}\} = max\{max\{TM_{SUB1,t} + TM_{SUB2,t} + LIQ_t + CONC_t; 0\} + TM_{SUB3}; max\{TM_{SUB1,t+1} + TM_{SUB2,t+1} + LIQ_{t+1} + CONC_{t+1}; 0\} + TM_{SUB3}\},$$

with *TM* of the first formula equal to TM_t of the second formula (*t* and *t+1* are *Settlement risk add-on* portfolio configurations, i.e. *t*: current, 'unaltered' and *t+1*: future, 'altered');

$$TM_{SUB1} = \sum_{PG} max\{ordinary\_weight * (IM_{SUB1,PG,ordinary} + DECO_{SUB1,PG,ordinary}) + stressed\_weight * (IM_{SUB1,PG,stressed} + DECO_{SUB1,PG,stressed}); IM_{SUB1,PG,ordinary} + DECO_{SUB1,PG,ordinary}\} + \sum_{i \in SUB1} MtmM_i,$$

with *i*: net position in instrument and *PG* product group (please refer to the document depicting the product scope);

$$TM_{SUB2} = \sum_{i \in SUB2} IM_i,$$

with *i*: net position in instrument;

$$TM_{SUB3} = \sum_{i \in SUB3} IM_i,$$

with *i*: (net) position in instrument arising from a single contract.

ordinary_weight and *stressed_weight* are model parameters (please refer to the relevant document).

The computation adheres to the convention of subtracting long positions from short positions (S - L) to obtain net positions to express margin debts as positive quantities and margin credits as negative quantities. Therefore all margin components in the above formulas represent a debt (+) for the Clearing Member except for *MtmM*, which can represent a credit (-) or a debt (+).

The *Total Margins* illustrated above exclude potential additive margin components linked to stress testing. The actual amount called to the margin account, which we can call *Total Margins Plus Stress Margins*, will be the sum of the *Total Margins* and such additional components.