Nodal Exchange Margining Methodology

Initial Margin Calculation

LCH.Clearnet calculates Initial Margin for Nodal Exchange transactions using a historical simulation VaR methodology. A clearing member's portfolio is first revalued using historical returns, then the standard deviation of the portfolio P&L is used together with other parameters to estimate the portfolio VaR. More specifically, the VaR of a portfolio is calculated using the following formula:

$$VaR_{Portfolio} = \sigma * \sqrt{h} * \alpha$$

where:

σ: Standard deviation of the portfolio P&L

α: Standard deviation multiplier, which is a parameter set by LCH.Clearnet

h: Holding period in days, which is a parameter set by LCH.Clearnet

In addition to the calculation above, LCH.Clearnet also calculates a minimum margin figure to ensure that a minimum level of margin is called. To calculate the minimum margin, the Minimum Margin Percentage (MP), a parameter set by LCH.Clearnet, is multiplied by the total gross portfolio value (the absolute value of the long positions plus the absolute value of the short positions)

$$\text{Minimum Margin} = \sum_X Abs(PV(X)\ ) * MP$$

MP is the minimum margin percentage, a parameter set by LCH.Clearnet. *PV(X)* is the latest position value calculated as the product of the size of the position (# of lots):

$PV(X) = \#\text{ of lots} * \text{Lot Size} * \text{Max}(P_T, MPT)$

where:

Lot size: # of MWh per lot
P_T : Latest Price ($ per MWh)
MPT: Minimum Price Threshold, which is a parameter set by LCH.Clearnet

Once the minimum margin has been calculated, the initial margin is the greater of either the margin calculated with VaR or the minimum margin:

$$\text{Initial Margin} = Max(VaR_{Portfolio}, \text{ } Minimum\ Margin)$$

Prices

To calculate accurate initial margin requirements, the VaR methodology relies on price histories that represent the historical volatility of the contract. In most cases, the historical price series for the contract are used in the VaR calculation, but in two situations – current month contracts and contracts that have not traded before – a constructed price history is used. The historical price series for the contract prior to current month is less volatile than its price behavior in current month. To more accurately reflect a contract's volatility in current month, therefore, a price series formed from the concatenation of prior current month price histories for that location is constructed and used in the VaR calculation. For contracts that have never been traded, synthetic price history methodologies have been developed, which employ combinations of the historical day-ahead locational marginal prices (LMPs) for the specific RTO node location and correlated exchange pricing history. As the contract trades, the synthetic prices are replaced by the daily price marks.

It is possible for Nodal Exchange contracts to have negative or near zero prices. If this were to happen, an incorrect price return could be produced from a negative price, and excessive price returns could be generated from near zero prices. Two additional parameters have therefore been added to the VaR calculation: Minimum Price Denominator (MPD) and Price Threshold for VaR (MPV). These two parameters are implemented in the following way for the calculation of returns and VaR contribution:

$$R_{i,t} = \underline{(P_{i,t} - P_{i,t-1}) /} \text{ Max (Abs } (P_{i,t-1}), \text{ MPD)}$$

$$V_t = \sum_i (R_{i,t} \times \text{Pos}_{i,t} \times \text{Max (Abs } (P_{i,t}), \text{ MPV))}$$

Variation Margin calculation

In order to support twice daily marks to market, Nodal Exchange provides a settlement price for all contracts (combinations of location and expiry date) available to the market. If a contract does not trade that day, Nodal Exchange still provides both a mid-day and an end of day settlement price. As Nodal Exchange offers auctions with all locations only once per week, the prices of most contracts are necessarily extrapolated. To extrapolate the price of a contract, each nodal location is paired with the hub or zone its historical pricing behavior is most closely correlated with based on the past 1-2 years of LMP history. The price at the untraded nodal location is then simply extrapolated from the change in price of the hub or zone contract with the same expiry.

Parameters

The LCH parameters for the above detailed calculations currently stand at the following values:

Nodal Initial Margin Parameters					
Holding Period	**Standard Deviation Multiplier**	**Minimum Margin Percentage (% of GPV*)**	**Price Threshold for Minimum Margin**	**Minimum Price Denominator**	**Price Threshold for VaR**
2 days	3.8	0.15	2.5	2.5	2.5