



Default Strategy

Commodity Derivatives

Nasdaq Clearing AB

Revision History

Version	Comment	Date
1.0	First version for external and internal distribution	2013-10-18
1.1	Forced termination description	2015-08-26
1.2	Annual review, only minor changes in language	2015-12-23
1.3	Annual review, only minor changes	2016-09-05
1.4	Annual review, no changes	2017-09-20
1.5	3 LoD review, Head of Risk Operations added to DC	2018-03-16 (as of 2018-04-01)

Table of Contents

Revision History	2
Introduction	4
Overview of the default management process	5
PART 1 - Risk assessment of the portfolio	6
Inform the CDC	6
Default Notification	6
Take Possession of Collateral.....	7
Prices, Valuation and Margin Check	7
Assessment of Risks	7
PART 2 – Close-out and Hedge Strategies	7
Futures and Deferred Settlement Futures close-out and hedge.....	8
Options close-out and hedge.....	8
PART 3 – Means of execution	8
Supervised close-out.....	9
Auction.....	9
Exchange, Broker and Proxy Trading	9
Forced Termination	10
PART 4 – Distribution of Losses	10
Appendix 1 – Market Maker and Close-Out Volume Provider Contact List	11

Introduction

The Default Strategy for Commodity Derivatives defines the actions to be taken in case of a default of counterparty with a portfolio containing various commodity derivatives. The process of risk assessment, hedge and close-out strategies and means of execution are outlined below.

Risk Management (RM) of Nasdaq Clearing AB (the Clearinghouse) are responsible for providing a risk assessment of the portfolio of the defaulting counterparty to the Clearing Default Committee (CDC), together with a proposed close-out and/or hedge strategy. The close-out and hedge strategies take into account differences between types of instruments cleared at Nasdaq Clearing AB.

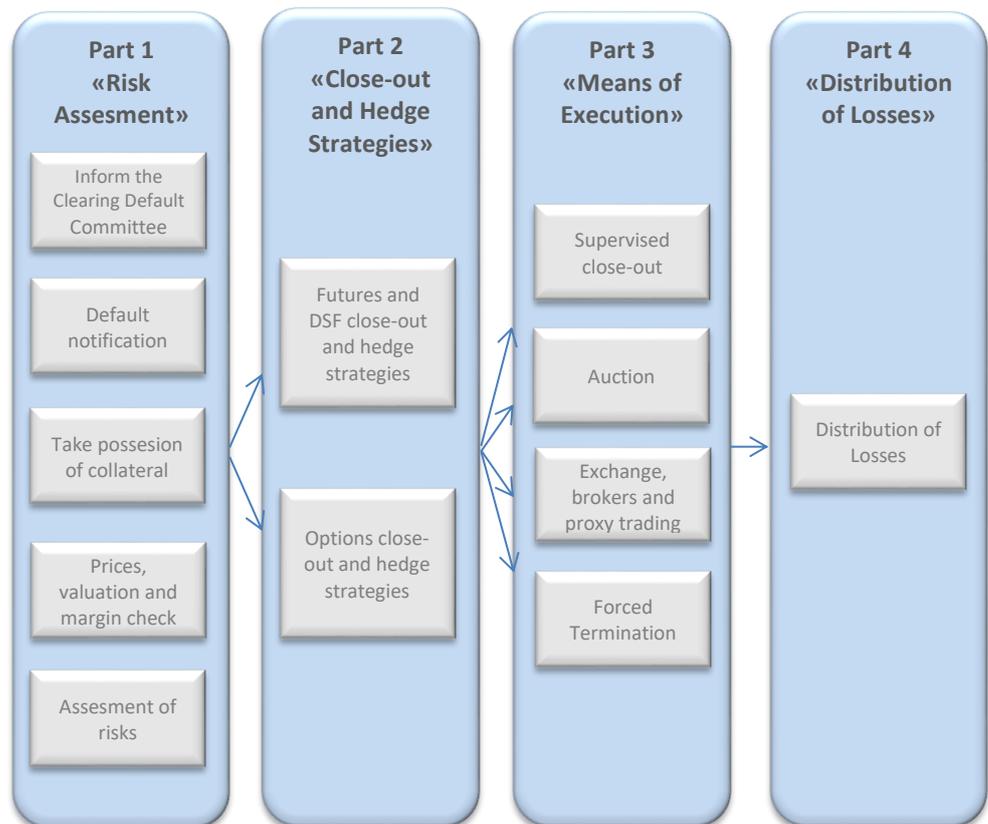
The CDC decides the strategy to be used for the close-out or hedge. Depending on the default situation, the close-out or hedge can be executed through supervised close-out, auction, exchange, brokers and proxy trading or forced termination.

Overview of the default management process

As a portfolio of a defaulting counterparty may contain a mix of commodity derivatives, the default process will need to cater for all financial commodity derivatives.

The objective of the default management process is to close out and/or mitigate the market risk of the defaulted counterparty's portfolio, minimize the costs and thereby the expenses of the defaulted counterparty, participants to default funds and the Clearinghouse in the process. The default management process is presented in the Figure 1 below.

Figure 1 "Overview of the default management process"



The default management process consists of several steps. To start with, the CDC will be informed as well as the defaulting counterparty and other relevant stakeholders will be notified. The Clearinghouse will take possession of any collateral. Further, the latest market prices will be obtained. In order to get the most recent valuation of member's portfolio, RM has an opportunity to perform an additional margin and collateral evaluation run in the clearing system. RM will also do a risk assessment of the defaulting party's portfolio. Based on the risk assessment, the portfolio will be divided into buckets and priorities will be assigned to the buckets with respect to hedge and close-out. The priority shall be given upon sensitivity to changes in prices and volatility, size of positions, offsetting risk, time to delivery, liquidity etc. RM will recommend appropriate close-out and hedge strategies for the buckets in question. Upon approval by the CDC, close-out and hedge strategies will be consequently executed through a supervised close-out, auction, exchange, brokers, proxy traders or forced termination.

PART 1 - Risk assessment of the portfolio

In a default situation, the first step is to inform the CDC. Further, the defaulting counterparty and all relevant stakeholders will be notified. Then all available collateral will be withheld. RM is responsible for analyzing the defaulting member's portfolio using the most recent market data. This entails creating buckets, assessing risk in each bucket and assigning priorities to the buckets. Based on the analysis, RM recommends close-out and hedge strategies to the CDC.

INFORM THE CDC

The CDC is a sole decision making authority for all decisions concerning default events and close-out handling in the Clearinghouse's default management process.

The CDC consists of the following ordinary members:

- The President of Nasdaq Clearing AB
- Chief Risk Officer (CRO)
- Head of Risk Operations
- Chief Technology Officer
- Representative from Legal
- Representative from Treasury
- Representative(s) from Group Risk Management (observer – no quorum)
- Representative from Communications (observer – no quorum)
- Any other person(s) deemed appropriate by the CDC during a default situation

The CRO acts as Chairman of the CDC and together with the President makes the decisions in the Committee. If the Chairman and the President disagree on which action to take, the Chairman should address the issue to the Board of Directors of Nasdaq Clearing.

DEFAULT NOTIFICATION

One of the main responsibilities of the CDC throughout the default process is communication. Specifically, default notifications will promptly be sent to the following recipients:

- The defaulted counterparty
- If the defaulted counterparty is a clearing client, the client representative should be informed first
- If the defaulted counterparty is a client representative, all clearing clients under the representative must be informed
- If the defaulted counterparty is a GCM, it should be encouraged to inform its GCM clients. The Clearinghouse may also consider to inform any associated NCMs in parallel
- The market, through the distribution of an "Exchange and Clearing Information" and publication on the website
- Management and the Board of Directors
- The Swedish/Norwegian FSA
- Brokers
- Other CCPs

TAKE POSSESSION OF COLLATERAL

Upon the notification of the CDC, the Clearinghouse will take possession of the collateral provided by the defaulted counterparty. Treasury non-US is responsible for using the collateral to meet the liquidity needs of the Clearinghouse in relation to the default.

PRICES, VALUATION AND MARGIN CHECK

Margin runs are scheduled hourly in the clearing system throughout the course of a normal business day. RM also has the possibility to manually trigger additional margin runs if deemed necessary. The clearing system's ordinary calculations of market values and margins will be used to monitor the progress of the close-out process. A margin simulation tool will also be used to simulate the effect of close-out and hedge trades as well as changes in prices and volatility.

ASSESSMENT OF RISKS

The portfolio of instruments belonging to the defaulting counterparty will first be categorized to identify market risk. The contracts will be divided into buckets based on the factors below:

- *Sensitivity to changes in prices and implied volatility* – The sensitivity of the portfolio to shifts in the price and implied volatility curves should be considered. The portfolio may also contain non-linear instruments that are particularly sensitive to shifts and therefore should be prioritized.
- *The size of positions* – Large positions should be prioritized ahead of smaller positions.
- *Off-setting risks* – Trades and positions in different directions can have resulted in margin offset as a result of the correlation/netting benefits offered by the Clearinghouse. These groups of “spread trades” need to be hedged and closed down near to simultaneously as not to unlock risks for which the Clearinghouse has not demanded collateral. These positions provide a natural hedge effect and should be closed down after positions with higher risk.
- *Time to delivery* – Positions close to delivery should be prioritized before instruments with delivery further out on the curve.
- *Liquidity* – The liquidity of the instruments has impact on priority and an approach used for close-out and/or hedge

Buckets consisting of open positions that pose an open market risk in the portfolio and which are not possible to hedge should be identified and prioritized. Any parts of the portfolio that are hedged or have a fairly good hedge could be set aside and handled at a later stage.

PART 2 – Close-out and Hedge Strategies

After having formed a clear view of the risk in the defaulting counterparty's portfolio, RM evaluates possible close-out and hedge strategies to recommend to the CDC.

In general, close-out and hedge strategies are universal across all commodities markets at the Clearinghouse. However, there might be discrepancies in handling of

the different derivative types. Therefore, close-out and hedge strategies can be separated into two groups: futures/deferred settlement futures close-out and hedge strategies and options' close-out and hedge strategies.

FUTURES AND DEFERRED SETTLEMENT FUTURES CLOSE-OUT AND HEDGE

The following close-out and hedge strategies can be applied to futures and deferred settlement futures:

- Buying or selling corresponding instrument series
- Buying or selling any instrument series which will allow to form a Risk Neutral Position (RNP) or a synthetic RNP
- Buying or selling more liquid and/or later expiring instrument series in the same or another derivative market having a high correlation to the instrument in question
- Delta-hedge with options (note that delta-hedge with options can only momentarily close out-the risks. The gamma value, i.e. the sensitivity of the delta value, has to be examined and the portfolio might have to be readjusted if the market moves in order to maintain delta-neutrality)

OPTIONS CLOSE-OUT AND HEDGE

The close-out and hedge of option instrument series is performed as below:

- Go long or short in options with similar expiries or strike prices
- Delta-hedge by buying or selling underlying contracts
- Delta-hedge by using delta and gamma values of the different option contracts to create a decent hedge (note that a delta-neutral option that is not gamma-neutral will need constant updating and readjustment in order to maintain delta-neutrality)

After being presented with the risk analysis and proposed strategies, the CDC will approve close-out and hedge strategies before they can be executed. As a basis for the decision, the CDC will need information about the approximate hedge cost. The CDC can then mandate RM to execute on the close-out or hedge strategy under the provision that the prices executed on are within a certain spread from the observed mid-price.

PART 3 – Means of execution

The Clearinghouse can close down or hedge a portfolio in several different ways. Under certain circumstances, the defaulting counterparty may be allowed to close down or hedge the portfolio under strict supervision from RM. If this is not an option, the Clearinghouse can choose to close down or hedge the portfolio through the exchange, brokers or through proxy trading. Alternatively, the portfolio can be closed down through an auction, where either the whole portfolio is sold to one participant or divided and sold by parts. In this case, it is important that the Clearinghouse has close-out agreements with market makers or other members. For some contracts, the Clearinghouse may also execute forced termination, where buyer(s) or seller(s) in the relevant contracts are randomly selected for termination of their contracts.

SUPERVISED CLOSE-OUT

In some circumstances, the defaulting member may be allowed to close down the portfolio. In these cases, the member is a professional player who has knowledge and ability to perform close-out. On mandate from CDC, RM will advise, guide or instruct the member on which positions to close down and in which order. RM will also continuously monitor all trades performed by the member. If needed, RM may recommend to the CDC to take over the close-out.

AUCTION

The Clearinghouse may choose to close out a defaulting member's portfolio through a closed auction, attempting to unwind the entire portfolio to one participant or divide the portfolio between two or more participants. Auctions can also be used to hedge a portfolio. The process is reliant on members contributing prices on close-out volumes. One or several members may participate in an auction and the portfolio is allocated based on the best bid and ask quotes or the best bid for the entire portfolio.

Members that have signed close-out agreements will be contacted first if the portfolio of the defaulting member is auctioned. The close-out agreement is non-binding, based on voluntary contribution. According to the agreement, the member undertakes to use its best endeavors (best effort) to offer the Clearinghouse binding bid and ask quotes (two-way spread) of the applicable products in the volume requested by the Clearinghouse. The member may fulfill the requested volume in whole or part.

The Clearinghouse may choose to disclose the portfolio to one or more members, given that they sign an "insider information notice". The Clearinghouse provides the party with detailed information about the portfolio, in order to enable the company to consider a bid on the portfolio pursuant to the "Close-Out Volume Provider" agreement with the Clearinghouse.

In some situations, it might be beneficial to divide the portfolio into sub-portfolios. Some participants may have explicitly stated their inability to provide prices on certain markets or instruments. In the case that the portfolio contains such, a sub-portfolio without these instruments may be created for all to be able to participate.

The close-out or hedges will be executed at the best prices provided. The Clearinghouse decides on its own discretion whether to call on quotes, and may choose to accept or reject any or all quotes. The Clearinghouse will consider whether any combinations of bids for sub-portfolios would result in a more beneficial bid for the total portfolio than what has been received.

EXCHANGE, BROKER AND PROXY TRADING

The Clearinghouse has an opportunity to conduct close-out and hedge trades through the Exchange, by using brokers or proxy trading.

Exchange trading

In case of close-out and hedge through the exchange, the internal trading desk will be involved. The internal trading desk will execute trades at the best price available in the market under the supervision of RM. Transactions will be manually registered on the defaulting member's account through the Trading Workstation.

Trading through brokers

Alternatively, the Clearinghouse may place volumes through brokers. Assigned broker(s) will obtain two way spread on the contracts or buckets in questions. As the best quotes are chosen, the transactions will either be executed by the broker or by the internal trading desk upon advice from the broker.

Proxy trading

The close-out and hedge trades can also be performed through proxy trading. The proxy will then go out in the market under own name and request a bid or ask on behalf of the Clearinghouse. The Clearinghouse then accepts the best price provided.

FORCED TERMINATION

Members that hold opposite positions in certain option contracts may be subject to forced termination in accordance to the relevant contract specification. The forced termination may be applied to all or parts of the positions at a forced termination contract price calculated by the Clearinghouse. The Clearinghouse shall in this event randomly select buyer(s) or seller(s) in the relevant contracts for termination of their contracts, and organize and perform settlement. The Clearinghouse will select increments of five lots until the defaulting members' positions are closed. The selection is with replacement, which means that one clearing member may be selected more than once.

A member, who is selected for forced termination, shall be immediately informed following the decision by the Clearinghouse to execute. The member will receive information through oral and written electronic communication. Information is considered delivered by the Clearinghouse upon attempt to contact the member by phone and sending written information.

The forced termination contract price will be set by the Clearinghouse using the Black 76 formula adjusted with reference to the Turnbull and Wakeman approximation. The basis for the calculation will be market prices of the contract for the underlying as set by the Clearinghouse at the time of the forced termination adjusted up or down within the risk interval to the disadvantage of the defaulter. The implied volatility for the preceding Bank Day will be used; it will be adjusted up or down within the implied volatility scenario. In the event that market prices and implied volatility of multiple contracts with the same underlying and the same delivery period is subject to adjustment, market prices and implied volatility of all such contracts should be adjusted in the same direction. Currently, market prices are adjusted up or down by 50% of the risk interval while implied volatility is adjusted up or down by 30%.

PART 4 – Distribution of Losses

In the event that the default process results in losses which are greater than the defaulting counterparty's pledged collateral, the excessive losses will be covered by the default fund. The default fund waterfall starts from the bottom and works its way through the capital resources towards the top of each pillar. The proceedings for distributing the losses are described in the documentation covering the default fund.

Appendix 1 –Close-Out Volume Provider Contact List

Not for public disclosure