NOTICE TO MEMBERS

No. 2018 - 139

November 9, 2018

REQUEST FOR COMMENTS

AMENDMENTS TO THE RULES, RISK MANUAL AND OPERATIONS MANUAL OF THE CANADIAN DERIVATIVES CLEARING CORPORATION FOR THE IMPLEMENTATION OF A NEW RISK SYSTEM

On November 1st, 2018, the Board of Directors of Canadian Derivatives Clearing Corporation ("CDCC") approved certain amendments to the Rules, Risk Manual and Operations Manual of CDCC. The purpose of the proposed amendments is to (i) implement a new risk system, and (ii) enhance CDCC's risk management processes and methodologies.

Please find enclosed an analysis document as well as the proposed amendments.

Process for Changes

CDCC is recognized as a clearing house under section 12 of the *Derivatives Act* (Québec) by the Autorité des marchés financiers ("AMF") and as a recognized clearing agency under section 21.2 of the *Securities Act* (Ontario) by the Ontario Securities Commission ("OSC").

The Board of Directors of CDCC has the power to approve the adoption or amendment of the Rules, Risk Manual and Operations Manual of CDCC. Amendments are submitted to the AMF in accordance with the self-certification process and to the OSC in accordance with the process provided in the Recognition Order.

Comments on the proposed amendments must be submitted before **December 11, 2018**. Please submit your comments to:

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A copy of these comments shall also be forwarded to the AMF and to the OSC to:

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Glenn Goucher
President and Chief Clearing Officer
CDCC

AMENDMENTS TO THE RULES, RISK MANUAL AND OPERATIONS MANUAL OF THE CANADIAN DERIVATIVES CLEARING CORPORATION

IMPLEMENTATION OF A NEW RISK SYSTEM

CONTENTS

I. SUMMARY

The Canadian Derivatives Clearing Corporation ("CDCC") is proposing changes to its Risk Manual and Operations Manual (and incidental changes to the Rules) in support of (i) the implementation of a new risk system ("NRS"), and (ii) the enhancement of CDCC's risk management processes and methodologies, the whole in accordance with the principles stated in the report entitled *Resilience of central counterparties (CCPs): Further guidance on the PFMI* (the "Resilience Report")[1] published in 2017 by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions ("CPMI-IOSCO") .

In 2017, TMX Group decided to modernize the technology underlying its clearing platforms and the related financial risk-management system. The overall objective of this major project is to improve and enhance risk management by replacing aging technology, reducing the need for manual processes and strengthening the risk models used by CDCC in its day-to-day activities. The project is also expected to provide CDCC with greater flexibility in its clearing and risk-management systems, allowing such systems to better adjust to evolving clearing and risk standards and requirements. This modernization is a multi-year project with the NRS expected to be implemented in January 2019. Other components of the project are targeted to be implemented later in 2019.

In addition to the risk system modernization project, CDCC also wishes to upgrade its risk management processes based on the recent guidance issued by CPMI-IOSCO in the Resilience Report. This guidance provides additional clarity on certain aspects of the *Principles for market infrastructure* ("PFMIs") for central counterparties. Following the release of the Resilience Report in July 2017, CDCC conducted a self-assessment of its risk management processes and developed a remediation plan to better align its risk management processes with the principles stated in that Resilience Report. The implementation of this plan now coincides with the implementation of CDCC's NRS.

Because the proposed enhancements stemming from the introduction of the NRS, on one hand, and the Resilience Report, on the other hand, are strongly intertwined, CDCC intends to implement these enhancements at the same time; hence, this analysis will provide a description of the system changes and rule changes required for both projects.

The proposed changes have been categorized as follows:

1) Changes to the Base Initial Margin methodologies and certain Additional Margins: The introduction of the NRS will lead to the implementation of improved and adequate risk

[1] https://www.bis.org/cpmi/publ/d163.pdf Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions, July 2017.

methodologies, for instance, by using a Value-at-Risk ("VaR") margin methodology for Fixed Income Transactions. Changes to certain additional margins are also proposed to enhance CDCC's risk measurement and adapt such risk measurement to the functionalities of the NRS. In regards to the measurement of the liquidity risk and concentration risk, changes to the "Margin Period of Risk" (currently known as "Close-out Period or Liquidation Days") are proposed by CDCC. Finally, changes will also be proposed to enhance the risk measurements for options.

2) Changes to Clearing Fund methodology: CDCC's remediation plan based on the guidance provided in the Resilience Report will lead to changes to (i) the current intra-month monitoring and resizing process used to recalibrate the Clearing Fund if the consumption reaches 90% of the Clearing Fund size, and (ii) the integration of new stress testing factors in the Clearing Fund methodology.

The systems changes and the rule changes contemplated by the implementation of the NRS and the enhancement of CDCC's risk management processes and methodologies in accordance with the Resilience Report have been subject to the proper governance review. Such governance review is embedded in the enterprise risk management framework of CDCC, and involves the elaboration of risk appetite statements, various frameworks for the identification, monitoring and management of risks as well as reporting to the internal risk management committee ("RMC"), the external industry risk committee ("RMAC") as well as to the board of directors. In accordance with the established governance arrangement, CDCC's RMC, acting as the second line of defense, was responsible for the oversight and effective challenge of the system changes and rule changes proposed in this analysis. The RMAC mandate, which is an industry advisory committee to the board, is also responsible for advising on Clearing Fund requirements, stress Margin requirements, Margin requirements for Clearing Members, acceptable forms of collateral, delivery and settlement procedures and Default Management Process. The system changes and rule changes proposed in this analysis have also been presented to the RMAC.

Unless otherwise indicated, all terms defined in this analysis have the meaning ascribed to them in the Rules and Manuals of CDCC.

II. ANALYSIS

a. Background

1) Changes to Margin methodologies and certain Additional Margins

With the implementation of the NRS and the requirements pertaining to the Resilience Report, CDCC is proposing amendments to its Risk Manual targeting the Margin framework. The proposed amendments are summarized below:

(i) **Change from a SPAN[2] methodology to a Value-at-Risk (VaR) methodology for Fixed Income Transactions**

The SPAN methodology is widely used in the industry as a risk measurement tool for Futures and Options positions. With the introduction of the repo fixed income service in 2012, CDCC adjusted the SPAN methodology to operationalize SPAN for the Fixed Income Transactions. With the implementation of the NRS, and in order to address certain SPAN limitations for Fixed Income Transactions, CDCC is proposing to change its initial margin model for Fixed Income Transactions by implementing a Value-at-Risk approach, or VaR methodology. The VaR methodology will also be used for all Unsettled Items following the physical delivery of interest Futures contracts.

(ii) Change in the number of liquidation days

In CDCC's Risk Manual, the term "Close-out Period" is defined as the period that CDCC needs to close-out a defaulting Clearing Member positions during normal market conditions without incurring liquidation costs. This term is used in the calibration of the Base Initial Margin. Currently, CDCC considers different Close-out Periods depending on the product cleared. In order to assess the different Close-out Periods, CDCC estimates the liquidity difference between a standard 2-day product and the product subject to close-out, using liquidity metrics such as volume and open interest. With this approach, the inherent market liquidity risk of a product is embedded in the Base Initial Margin.

CDCC is proposing to adopt an alternative way to measure and account for the inherent market liquidity risk of a product whereby the Base Initial Margin only contains market risk component. The inherent market liquidity risk will be added to the "Additional Margin for Concentration Risk". Consequently, CDCC will consider a 2-day Close-out Period for all Futures, Options (except OTCI Options), Fixed Income Transactions and Unsettled Items, and a 5-day period for OTCI Options.

CDCC is also renaming the concept of Close-out Period as the "Margin Period of Risk" or "MPOR", which refers to the period required to close-out non-concentrated positions in a particular contract either through liquidation or auction, or by hedging or neutralizing the market risk.

(iii) Change to the Additional Margin for Concentration Risk

Under CDCC's current Margin framework, an additional margin is required for concentration risk. The term "concentration risk" refers to the risk of loss that may result when liquidating a large position relative to the assumed *ex ante* market liquidity in a particular Underlying Interest. In such a scenario, the realized and assumed Close-out Periods would not match, thereby exposing

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[2] SPAN is a registered trademark of Chicago Mercantile Exchange Inc.

CDCC to a financial loss. As a means of mitigating this risk, CDCC requires an Additional Margin for Concentration Risk when positions exceed certain thresholds.

In line with CDCC's proposal to adopt an alternative way to measure and account for the inherent market liquidity risk of a product, the Additional Margin for Concentration Risk (that will be renamed "Additional Margin for Market Liquidity Risk") will both cover the inherent market liquidity and concentration risks. CDCC is also proposing to change the concentration methodology whereby the additional cost will not be measured by an increased number of days over the MPOR, but instead by an absolute surcharge or relative surcharge to positions in a group exceeding a predetermined threshold.

(iv) Change to the Additional Margin for Specific Wrong-Way Risk

The Additional Margin for Specific Wrong-Way Risk covers the risk that arises when the exposure of a Clearing Member in its own products is adversely correlated with the creditworthiness of that Clearing Member. For example, if a Clearing Member holds a short put Option on its own stock, the default of this counterparty will likely drive the stock price toward zero, generating a significant loss on the short put option at the same time. Depending on the positions held by the Clearing Member, CDCC uses a methodology to account for the specific wrong-way risk (Put options, Share futures and Unsettled Items). CDCC is of the view that the current methodology is too conservative and that adjustments to the methodology are required to principally include the right-way risk and to account for the risk of call Options.

(v) Change to the Additional Margin for Mismatched Settlement Risk

A mismatched settlement risk is the risk arising from a lag between the settlements of positions that provide a margin offset with other positions. More specifically, in certain circumstances, CDCC could face the risk that a Clearing Member settles a position that provides a Base Initial Margin offset with other positions. Currently, the additional margin is computed once a day at 12:45pm. With the implementation of the NRS, CDCC will be able to measure this risk within the system instead of using a desktop application. Therefore, CDCC is now proposing to measure the Additional Margin for Mismatched Settlement Risk at each margin run. Moreover, as this additional margin will be computed four (4) times a day, one of the eight (8) scenarios currently imbedded in the methodology will not be required anymore.

(vi) Change to the Additional Margin for Intra-day Variation Margin Risk

The intra-day variation margin risk arises when market volatility or surge in trading volumes produces unusually large variation margin exposures. Currently, if the intra-day variation margin risk exposure of a Clearing Member's Futures and Fixed Income Transactions exceeds 25% of such Clearing Member Margin requirements or 100% of its Clearing Fund contribution, subject to a floor of $10 million, CDCC may call an additional margin to cover such intra-day variation margin risk. As a result of the automation of this measure in the NRS, CDCC is now proposing to measure the additional margin at each margin run (i.e. four (4) times per day). Moreover, for the first implementation phase of the NRS, CDCC is proposing to remove one of the criteria used in establishing the applicable threshold. The threshold will be based only on 25% of the Clearing Member's Margin requirements, subject to a floor of $10 million.

(vii) Introduction of a new Additional Margin for Unpaid Option Premium Risk

When a Clearing Member buys an Option during the day, the trade is subject to the cash settlement process on the next morning. As a result, CDCC could face potential losses caused by the default of the buyer before the Option premium payment. In order to cover such risk, CDCC will introduce a new additional margin to collateralize the Option premium to be paid until the payment on the next day.

(viii) Introduction of a new Additional Margin for Banking Holiday Risk

Currently, CDCC adds one (1) additional Business Day to the Close-out Period for equity and index products to reflect the fact that it is impossible to receive any cash settlement amount during Remembrance Day (the banks are closed in Canada during that day). However, besides the additional market risk that CDCC could face during the Remembrance Day, there is also a risk related to incremental exposures arising from new trades. As a result, CDCC has reviewed the methodology of the Additional Risk for Banking Holiday, and proposes to combine and measure these two (2) types of risk in one (1) additional margin.

(ix) Changes impacting the SPAN methodology for options

With the introduction of the NRS, CDCC is proposing to make some adjustments to certain risk parameters for Options. The main modifications will consist on the activation of the Volatility Scan Range to stress the volatility of Options. The other modifications include a change of the pricing model for American Options, from the Barone-Adesi & Whaley ("BAW") model to the Binomial model, and a change in the method used to calculate market liquidity risk for OTCI Options, from the liquidity interval method to the Additional Margin Market Liquidity Risk (currently known as Additional Margin for Concentration Risk).

(x) Changes impacting the Additional Margin for Capital Risk

CDCC is proposing a minor change to the calculation of the Additional Margin for Capital Risk. Under the current methodology, CDCC compares the Clearing Member's capital amount to the sum of the Base Initial Margin for all products and the variation margin requirements for Options and Unsettled Items. In the event that this margin amount exceeds the capital amount, an additional margin is collected. This process is updated once a day (end-of-day). In the NRS, the margin amount calculated will be limited to the Base Initial Margin for all products; variation margin requirements for Options and Unsettled Items will not be included. Moreover, this process will be updated at each margin calculation (intraday and end-of-day).

2) Changes to Clearing Fund methodology

Based on current practice, the Clearing Fund is resized on a monthly basis by taking the largest Uncovered Residual Risk over a 60-day period on which a buffer of 15% is applied. On an intra-month basis, CDCC also re-calibrates the Clearing Fund if an Uncovered Residual Risk exceeds the Clearing Fund value (also known as a "Cover 1 Breach").

Following the publication of the Resilience Report, CDCC has recognized that the intra-day credit risk exposure had not been fully considered in its Clearing Fund sizing methodology. As a result, CDCC performed an analysis of its historical Cover 1 Breaches and its credit exposure during intra-day periods. The analysis demonstrated that a more proactive approach in managing the size of the Clearing Fund would minimize the number of potential Cover 1 Breaches.

Consequently, CDCC proposes to change the current intra-month monitoring and resizing process to recalibrate the Clearing Fund if the consumption reaches 90% of the Clearing Fund size. In addition, CDCC wishes to integrate in the Clearing Fund methodology the guidance provided in the Resilience Report related to the stress testing including, without limitation, the types of stress test scenarios, the relevant markets risk factors and the appropriate aggregation method for the gains and losses. The revision of the stress test scenarios has led to a change in terms of the number of stress test scenarios, their calibration, and how the aggregation method is applied.

b. Description and Analysis of Impacts

The changes proposed by CDCC are now described in further details:

1) Changes to Initial Margin methodologies and certain Additional Margins

(i) Change from a SPAN methodology to a Value-at-Risk (VaR) methodology for Fixed Income Transactions

The SPAN methodology is widely used in the industry to measure risk of Futures and Options positions. With the introduction of the repo fixed income service in 2012, CDCC adjusted the SPAN methodology to operationalize SPAN for the Fixed Income Transactions. SPAN divides the positions in different portfolios based on groupings called Combined Commodities. Each Combined Commodity represents all positions on the same ultimate Underlying Interest. Margin is calculated at the Combined Commodity level and aggregated throughout the portfolio. The first step of the SPAN methodology is the outright margin calculations, executed by stressing the price of the Underlying Interest (the market risk factor) using multiple scenarios under normal market conditions. The maximum underlying price movement likely to occur over the Close-out Period is called the Price Scan Range. Then, the intra margin, also known as Inter-Month Spread Commodity, is added to the calculations to take into account the risk of offsetting positions with different maturities. Finally, a margin relief may be given to highly correlated products sharing reliable statistical relationship. For example, a 5-year bond and a 10-year bond issued by the Government of Canada, assuming both bonds share a strong economic correlation and present similar product characteristics, may lead to a portfolio margin relief.

For Fixed Income Transactions, the positions held by a Clearing Member are allocated in Combined Commodities based on the issuer and the tenor of the Fixed Income Transaction. The SPAN methodology selects the largest price loss of each specific Underlying Interest under multiple scenarios (a price/duration approach at the instrument level, using the volatility of the on-the-run instrument linked to the Combined Commodity, is used to calculate the Price Scan Range). An additional dollar amount charge is also applied to particular patterns of positions which may exist within the same group. Finally, a margin relief is given to Fixed Income Transactions sharing the same issuer (in the following jurisdictions: Canada, British Columbia, Ontario, Quebec). In order to quantify the risk related to the Floating Price Rate, a virtual Futures contract is also calculated with the SPAN methodology.

The main risk parameters (Margin Intervals to determine the Price Scan Range and Inter-Month Spread Commodity) are calibrated externally on a daily basis (via a desktop utility) based on a parametric method, with a selected confidence level and lookback period. To mitigate procyclicality, an exponentially weighted moving average ("EWMA") methodology is used with a floor. The EWMA is used in the estimation of the volatility by weighting the past market observations. The usage of EWMA produces smoother Margin requirements. Procyclicality can be defined as the changes in risk-management requirements or practices that are positively correlated with business credit-cycle fluctuations and that may cause or exacerbate financial instability[3].

Rationale for the proposed change: from SPAN to VaR margin methodology

With the implementation of the NRS, and in order to address certain SPAN limitations for Fixed Income Transactions, CDCC is proposing to change its Initial Margin model by implementing a VaR methodology that is widely used by many central counterparties worldwide. Such methodology is an alternative approach used to model more complex products under integrated portfolio margining. It explicitly takes into account the relevant risks factors in the risk evaluation (full revaluation method). Moreover, this methodology change complies with best industry practice

[3] (https://www.bis.org/cpmi/publ/d101a.pdf (CPSS and IOSCO 2012, p. 47, Section 3.5.6.

and is easily replicable based on the disclosure of the risk parameter calibration and the data source. VaR will also be used for physical delivery interest Futures contracts (Unsettled Items), since the Underlying Interest of Unsettled Items associated to these contracts (2Y, 5Y, 10Y and 30Y bonds issued by the Government of Canada) become fungible with similar instrument (at the ISIN) for Fixed Income Transactions.

Proposed methodology: VaR using volatility scaling and EWMA

The NRS will divide the positions in different portfolios based on groupings called VaR Risk Groups. Each VaR Offset Group represents all positions sharing the same market risk factors. Margin is calculated at that group level (with full margin offset) and is aggregated throughout the portfolio. The VaR methodology will use a non-parametric method where current market rates, which are the selected market risk factors for each VaR Offset Group, are perturbed based on historical scaled relative returns. The non-parametric approach relies on the observed historical distribution of risk factors.

For Fixed Income Transactions, the positions of a Clearing Member is allocated in VaR Offset groups based on the issuers of the Underlying Interest or a specific asset class (Canada, Canada RRBs, British Columbia, Ontario and Quebec). The market value of each portfolio is recalculated under all perturbed historical scenarios (using a full revaluation methodology, in compliance with Investment Industry Association of Canada's *Canadian Conventions in Fixed Income Markets*[4]). The Margin requirement will be based on the P&L scenarios which are the difference between the market value of the perturbed scenarios and the current portfolio value. Expected shortfall statistical treatment is used to determine the Margin requirement. The expected shortfall is a conditional probabilistic metric that calculates the average loss exceeding a certain threshold, generally the VaR.

With the new approach proposed by CDCC, all groups will share the same parameter configurations at the onset. However, the Margin model for each offset group may be recalibrated independently if required following a model validation. To mitigate procyclicality, a volatility scaling method will be used referring to EWMA in order to estimate the volatility, and an external buffer (using a desktop utility) will be added to the calculated VaR. CDCC will review the buffer monthly or at any time following a change to CDCC's risk model or the occurrence of an extreme market event. To ensure the stability of the buffer, CDCC will only change the buffer level if it is deemed stable for at least 3 consecutive months, and with the approval of the Chief Risk Officer.

In the current methodology, CDCC maintains a risk parameter for the Floating Price Rate. However, this risk is not embedded in the VaR methodology. In 2017, this risk accounted for 0.07% of the Base Initial Margin for Fixed Income Transactions. Please note that the change to

[4] https://iiac.ca/wp-content/uploads/Canadian-Conventions-in-FI-Markets-Release-1.3.pdf

the VaR methodology will not impact the variation margin calculations which compares the current Floating Price Rate and the agreed repurchase rate.

Please refer to Section 6.2 of the attached Risk Manual for additional details on this proposed change.

(ii) Change in the number of days in the Close-out Period (Margin Period of Risk)

Current methodology: Zero price impact approach

Currently, CDCC uses a 2-day period as the Close-out Period underpinning the calculation of the Initial Margin models for liquid exchange traded Derivative Instruments and for Fixed Income Transactions in CAD government securities. For OTCI Options (Converge), CDCC uses a 5-day period. However, for other less liquid Derivative Instruments, CDCC uses different Close-out Periods. In these cases, CDCC derives the Close-out Period through quantitative and qualitative analysis which attempt to measure the difference in terms of liquidity of the product or Underlying Interest. This approach is qualified as a zero price impact approach and assumes that the inherent market liquidity risk of a product is captured by increasing the Close-out Period. Hence, the Base initial Margin contains information on both the market risk and the inherent market liquidity risk.

Rationale for the proposed change: From a zero price impact approach to a fixed Margin Period of Risk approach

CDCC is proposing to change the approach by which it measures the inherent market liquidity risk. First, the inherent market liquidity risk component of the Base Initial Margin calculations will be removed. The Base Initial Margin will only capture market risk using statistical models. This approach is qualified as a fixed Margin Period of Risk approach, or MPOR. Second, the inherent market liquidity risk component will be added to the Additional Margin for Concentration Risk. As a result, the Additional Margin for Concentration Risk will be renamed as the “Additional Margin for Market Liquidity Risk”. This Margin add-on will supplement the Base Initial Margin to take into account the inherent market liquidity risk associated with the product and the concentrated positions. This change of approach is coherent with the development of the NRS where the Base Initial Margin component (linked to the market risk factors under the SPAN or VaR methodologies) is separated from other risk components which are more challenging to “modelize”.

Proposed methodology: Fixed Margin Period of Risk approach

CDCC is therefore proposing to use a 2-day Close-out Period for all cleared products, with the exception of OTCI Options which will retain a 5-day Close-out Period. The use of a similar Close-out Period for similar products provides many benefits. In fact, it facilitates any potential crossmargining for products sharing the same risk factor, such as the 5-Year Government Futures against the 30-Year Government Bond Futures. It also provides for coherent stress testing aggregation rules between products within the same asset class, which is in line with the Default Management Process. Backtesting at the portfolio level is also more consistent. Finally, as mentioned earlier, CDCC proposes to rename the Close-out Period as the "Margin Period of Risk", or MPOR, which refers to the period required to close-out non-concentrated positions in a particular contract either through liquidation or auction, or by hedging or neutralizing the market risk.

Please refer to Sections 1.1.1.2, 6.1 and 6.5 of the attached Risk Manual for additional details on this proposed change.

(iii) Change to the Additional Margin for Concentration Risk (Market Liquidity Risk)

Current methodology: Increased Close-out Period

Today, when a Clearing Member holds concentrated positions in a given Underlying Interest, CDCC increases the Base Initial Margin required from this Clearing Member with a surcharge to account for the additional risk. In such a case, the surcharge is translated through an increase of the Close-out Period, depending on the level of the concentrated positions and the liquidity level of the Underlying Interest traded. In other terms, CDCC increases the time it takes to close-out a concentrated position. The increase in Initial Margin level, consequent to the increase in the Close-out Period, represents the cost of closing-out a concentrated position.

Rationale for the proposed change and proposed methodology: Distinct cost

As an alternative methodology to measure liquidity and concentration risks, CDCC could also keep the MPOR constant and measure the cost of closing-out the positions within the set fixed MPOR. CDCC proposes to replace its current practice and adopt this approach. As described above, CDCC will use a 2-day MPOR for all the exchange-traded Derivatives Instruments (except OTCI Options) and the Fixed Income Transactions and a 5-day MPOR for its OTCI Options, thereby keeping only the market risk and generic liquidity consideration of the products in the Base Initial Margin. The liquidity and concentration risks that are specific to each product/ISIN will be instead measured and covered with the Additional Margin for Market Liquidity Risk. In addition to the benefits described earlier, CDCC believes that separating the market risk from the liquidity and concentration risks will help the Clearing Member to better assess and understand the risk source of its portfolios.

The Additional Margin for Market Liquidity Risk will consider an absolute surcharge (in dollar amount) or relative surcharge (in % to the Base Initial Margin) to positions or group of positions exceeding a predetermined threshold. The add-on is assessed by first identifying positions for which a dollar amount value (i.e. a market impact cost) or a relative charge would be applied. The add-on considers the liquidity risk by using the bid-ask spread measure and considers the concentration risk through a ratio of the position compared to the expected volume to be closed-out during the MPOR.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

(iv) Change to the Additional Margin for Specific Wrong-Way Risk

Current methodology

CDCC has identified three products for which the specific wrong-way risk ("WWR") exists: Put Options, Share Futures and Unsettled Items. Specific WWR will arise when an entity trades products with its own company's or affiliates' stock as the Underlying Interest. Identified WWR positions are excluded from the Base Initial Margin calculation in SPAN and an additional margin is calculated based on the scenario where the Underlying Interest value goes to zero.

Rationale of proposed change

CDCC is proposing to enhance to current methodology by first taking into account the right-way risk in determining the net WWR. The right-way risk materializes itself when the position held by the Clearing Member generates a profit at the same time the Clearing Member's creditworthiness deteriorates. The Corporation will also include the WWR for long Call Options (products that have been previously ignored in the methodology).

In order to be consistent with the overall architecture of a Base Initial Margin representing the pure market risk, CDCC will include, going forward, the identified WWR positions that are currently excluded. This will result in more transparency for the Clearing Member on the real requirement of its Base Initial Margin. CDCC will also make modifications to the WWR measurement to take into account the right way-risk and to increase the precision of the measure for Unsettled Items, by using directly the Underlying Interest price.

Proposed methodology

In the proposed methodology, identified WWR positions will be included in the Base Initial Margin calculation and an additional margin will be calculated based on the scenario that the Underlying Interest value goes to zero. The methodology will be the following, based on net positions (i.e the right-way-risk is included in the analysis):

Put Options: The full strike value amount minus the value of the net premium is charged as additional margin.

Call Options: The full value of the net premium is charged as additional margin.

Share Futures: The full settlement value amount is charged as additional margin.

Unsettled Items: The full amount of the Underlying Interest price is charged as additional margin to the positions resulting from an exercise or an assignment.

All WWR charges are capped at zero (if the right-way risk exceeds the wrong-way risk) at the product level (Put Options and Call Options, Share Futures, Unsettled Items). They are calculated at the sub-account level and aggregated at the Clearing Member level.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

(v) Change to the Additional Margin for Mismatched Settlement Risk

Current methodology

The mismatched settlement risk ("MSR") for Fixed Income Transactions is the risk arising from a lag between the settlements of positions which provide a margin offset against other positions. In certain circumstances, CDCC faces the risk that a Clearing Member settles a position that provides a Base Initial Margin offset with other positions and then defaults.

CDCC has identified eight scenarios representing the potential cases that may trigger a MSR following the settlement of positions. The determination of the Additional Margin for Mismatched Settlement Risk follows a two-step approach. First, CDCC measures the Base Initial Margin for all scenarios. Second, CDCC compares each Margin requirement to the original Base Initial Margin. The highest difference between the values results in the Additional Margin for Mismatched Settlement Risk. Currently, these steps are performed once a day, at 12:45pm, to account for a high proportion of daily change in positions.

Rationale for the proposed change and proposed methodology

With the implementation of the NRS, CDCC will be able to measure the MSR within the risk system instead of using a desktop application. Therefore, CDCC proposes to measure the Additional Margin for Mismatched Settlement Risk at each margin run, i.e four (4) times a day. As a consequence of increasing the frequency of this additional margin computation, one of the eight (8) scenarios used by CDCC for the calculation of the Additional Margin for Mismatched

Settlement Risk will no longer be used. This scenario was originally designed to capture the risk associated with positions having a settlement date beyond the current Business Day. Given the increase in the frequency of the measurement of the Additional Margin for Mismatched Settlement Risk, the reference to this scenario becomes useless with the end of day activity process and calculation.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

(vi) Change to the Additional Margin for Intra-day Variation Margin Risk

Current methodology

The risk covered by the Additional Margin for Intra-Day Variation Margin Risk arises when the market volatility or surge in trading volumes produces unusually large variation margin exposures. In order to address this risk, CDCC makes a margin call vis-à-vis each Clearing Member if it determines that CDCC's intra-day variation margin exposure to a Clearing Member exceeds a certain threshold in relation to the Clearing Member's Initial Margin and Clearing Fund contribution. Currently, the threshold is at 25% of the Clearing Member's Margin requirements or 100% of the Clearing Member's Clearing Fund contribution, subject to a floor of $10 million. The additional margin is computed by using a desktop utility.

Rationale for the proposed change and proposed methodology

With the introduction of the NRS, CDCC will be able to automate the calculation of this additional margin within the system. The calculation will also be performed at each margin run and not only at 12:45pm as it is currently the case. However, the NRS will not be able to apply the 100% threshold on the Clearing Member's Clearing Fund contribution. This feature will only be available to CDCC in a later implementation phase. To mitigate this situation, the newly proposed threshold (25% of the Base Initial Margin and not the Margin requirements) will be calibrated in order to obtain similar coverage for intra-day exposure as with the current methodology.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

(vii) Introduction of a new Additional Margin for Unpaid Option Premium Risk

When a Clearing Member buys an Option during the day, the payment of the premium will take place the next morning during the cash settlement process. Similarly, the seller of an Option will also receive from CDCC the Option premium the next day. CDCC is exposed to the risk that the Option buyer defaults before the payment is made on the next day. Thus, CDCC is proposing to introduce a new additional margin which will cover this risk. More specifically, CDCC will measure the net amount of Option premium to be paid to CDCC at each margin run and ask for this risk to be collateralized.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

(viii) Introduction of a new Additional Margin for Banking Holiday Risk

Current methodology

On each year's Remembrance Day (or, if the Remembrance Day is during a non-Business Day, the following Business Day), settlement banks are closed while trading at TMX is open. Therefore, no settlement and no margin call can be made on this day. This situation creates an additional market risk of one day. Currently, CDCC mitigates this risk by adding a supplemental day in the Close-out Period for the margin calculations of equity and index products.

Rationale for the proposed change

In addition to the additional market risk that CDCC could face during Remembrance Day, there is also a risk related to incremental exposures arising from new trades. In other terms, CDCC is exposed to two types of risk: 1) the market risk where market price variation may affect the value of the Clearing Members' positions, and 2) the position risk where Clearing Members can unexpectedly change their positions without suffering a margin increase. For this reason, CDCC has reviewed the methodology of the Additional Margin for Banking Holiday Risk and proposes to measure and combine the two risks into one supplemental additional margin.

Proposed methodology

For the position risk, CDCC will calculate and apply at the Clearing Member level a charge based on the historical Margin movements for the products that could be negotiated during the Banking Holiday. The charge is capped at 10% to prevent large movements in the Margin. With respect to the market risk, CDCC will add a charge equivalent to the incremental Margin that would have been required if an additional MPOR was added for eligible products. This change of approach is coherent with the development of the NRS whereby the Base Initial Margin component is separated from other risk components.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

(ix) Changes impacting the SPAN methodology for options

Volatility Scan Range

Currently, with respect to Options, CDCC only stresses the Underlying Interest for each Combined Commodity under multiple scenarios in normal market conditions. Due to technological limitations, stress scenarios for volatility were not activated in the production environment, but rather monitored under the sensitivity program. With the implementation of the NRS, CDCC will take the opportunity to add the volatility as a component that will be stressed as part of the risk measurement methodology. This component is called Volatility Scan Range, or "VSR". This addition will improve CDCC's Option Margin coverage because volatility is an important risk factor for Options.

Similar to the Price Scan Range for the Underlying Interest, the VSR corresponds to the maximum volatility movement that is likely to occur over the MPOR and is applied at the Combined Commodity level. Under each stress scenario, and using a full revaluation method, the loss of each Option is calculated taking into account both price and volatility shocks. Each Combined Commodity will have a distinct VSR which will be calibrated externally using a desktop utility. The calibration will be performed using the observed historical distribution of the implied volatility variation of the Option series for each Underlying Interest.

Please refer to Section 6.1 of the attached Risk Manual for additional details on this proposed change.

Binomial

In the current SPAN configuration, the BAW model was the selected American Option model. In the NRS, the Binomial method is implemented as the by-default model to price American Options. The main difference between the BAW model and the Binomial model is how they mathematically estimate the value of the Options. The BAW model uses analytic solutions (solving equations iteratively), while the Binomial model is based on numerical methods (binomial lattice or tree, where valuation is performed iteratively at each node of the tree). The Binomial model is already implemented in the NRS and offers very similar results (in term of options price values and delta calculations) to the validated BAW model. Because this model is based on a numeric method, it was calibrated appropriately (selection of the number of discrete steps in the tree) to offer a good balance between precision and computational performance.

Please refer to Section 6.1 of the attached Risk Manual for additional details on this proposed change.

Liquidity Interval method replaced by Additional Margin for Market Liquidity Risk

A liquidity interval is currently used for OTCI Options. This liquidity interval is added to the Margin Interval (based on the Underlying Interest price volatility with a Close-out Period of 5 days) to take into account the market liquidity risk with physical settlement (based on the historical bid-ask price spread of the Underlying Interest).

With the changes to the Additional Margin for Market Liquidity Risk, CDCC is proposing to capture this market liquidity risk directly in this distinct component. This change of approach is coherent with the development of the NRS in which the Base Initial Margin component is separated from other risk components.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

x) Changes impacting the Additional Margin for Capital Risk

In line with the overall architecture of the NRS, CDCC is proposing to calculate the Additional Margin for Capital Risk based exclusively on a comparison of the capital amount of a Clearing Member to its Base Initial Margin (excluding any collateralized additional margin such as the variation margin requirements). This additional margin for Capital Risk will also be calculated at each margin run, capturing intraday-day exposure, which will result in more precise margin requirements.

Please refer to Section 1.1.1.2 of the attached Risk Manual for additional details on this proposed change.

2) Changes to the Clearing Fund Methodology

Currently, the Clearing Fund is resized on a monthly basis by taking the largest Uncovered Residual Risk over a 60-day period on which a buffer of 15% is applied. CDCC also re-calibrates the Clearing Fund during a given month if a stress test result exceeds the Clearing Fund value. The Uncovered Residual Risk is measured by comparing the losses generated by applying stress market scenarios to end of day positions to the Base Initial Margin available during that day.

Following its review of the Resilience Report, CDCC has identified a partial gap in the way it ensures its sufficiency of financial resources to cover the largest aggregate credit exposure following the default of one Clearing Member and its affiliates (also known as Cover-1 Breach). Indeed, CDCC should be able to identify credit exposures on both an end-of-day basis and intra-day basis, recognizing the potential for the composition of the Clearing Members' positions to vary materially during the Business Day. As part of its review, CDCC has performed an analysis of its historical Cover 1 Breaches and its credit exposure on an intra-day basis. It was concluded that a more proactive approach in managing the size of the Clearing Fund would minimize the number of potential Cover 1 Breaches.

Consequently, CDCC is proposing to change the current intra-month monitoring and resizing process when the Clearing Fund consumption reaches 90% of the Clearing Fund size. More specifically, if the largest Uncovered Residual Risk exceeds 90% of the size of the Clearing Fund but it is inferior to 100% of the size of the Clearing Fund, the size of the Clearing Fund will be increased by 15%. If the largest Uncovered Residual Risk exceeds 100%, CDCC will update the size of the Clearing Fund using the current monthly resizing methodology.

In addition, CDCC wishes to integrate in the Clearing Fund methodology the principles regarding stress testing stated in the Resilience Report. Essentially, these principles provide for types of stress test scenarios, relevant markets risk factors and appropriate aggregation method for the gains and losses. The revision of the stress test scenarios has led to a change in terms of the number of stress test scenarios, their calibration, and how the aggregation method is applied.

Please refer to Sections 1.2 and 6.3 of the attached Risk Manual for additional details on this change.

c. Proposed Amendments

The main changes to the Risk Manual have been described in the previous sections of this analysis. Since it would be too cumbersome and unnecessary to provide another description of the changes in this section, please refer to Appendix 1 of this analysis for a review of the proposed amendments.

Nevertheless, the implementation of the NRS and the enhancement of CDCC's risk management processes and methodologies in accordance with the Resilience Report have also led to ancillary changes to the Risk Manual and Operations Manual:

<u>Risk Manual</u>

- Simplification and clean-up of certain definitions used in the Risk Manual and reliance to terms defined in Section A-102 of the Rules or elsewhere in the Rules or Operations Manual. For examples, the defined term "Clearing Engine" was not used in the Risk Manual and the defined term "Margin Requirement" has been removed since the term was often used incorrectly to mean "Margin" or "additional margin". Please note that the first sentence of the Risk Manual's Glossary indicates that "[u]nless otherwise defined in the Risk Manual, capitalized terms shall have the meanings given to them in the Rules", and the defined term "Rules" includes both the Rules and the Operations Manual;

- Simplification and clean-up of certain provisions of the Risk Manual for the convenience of the readers. For example, the provisions regarding the monitoring program have been simplified;
- Deletion of "examples" used to illustrate certain Rules, mainly in Section 6, as part of CDCC's decision to streamline the content of its Rules and Manuals by keeping the "rules" only.

Operations Manual

- Deletion of the concept of "Difference Fund Account" as a result of the implementation of the NRS. All additional margins will now be deposited in the Margin Fund Account;
- Deletion of all references to the additional margins in the Time Frames section of the Operations Manual. The Base Initial Margin and the additional margins will now be requested by CDCC at the same time, i.e. four (4) times a day;
- A new report entitled "Total Margin Requirement Report" (MS06) will be generated by the SOLA system and deposited automatically in the Clearing Members' FTP. The report will detail the Base Initial Margin requirements, the Variation Margin requirements, the additional margins and the Total Margin requirement amount. However, certain reports will not be produced and issued by CDCC anymore. That will be the case for the MS03 report entitled "Trading and Margin Summary" and some part of the MS05 report entitled "Span Performance Bond Summary Report". The data contained in these reports will be integrated into the new MS06 report. The other component of the MS05 report entitled "SPAN Performance Bond Summary" will not be prepared anymore as a direct result of the change in the risk methodology. The MR50 report entitled "Daily Capital Margin" will be decommissioned because the Margin requirement covered by this report will now become an additional margin. Finally, CDCC does not intend to prepare and issue the MR05 report entitled "Converge Position Limits Usage" to the Clearing Members, and CDCC has submitted to the Autorité des marchés financiers a distinct demand to that effect.
- CDCC has decided not to apply any Unsettled Item Margin anymore. Such margin was described in Operations Manual as an amount equal to not less than 105% of the market value of the Underlying Interest which a Clearing Member has failed to timely deliver.

Rules

- Following CDCC's decision not to apply any Unsettled Item Margin anymore (please see previous item), Articles B - 412, C-517 and D-307 of the Rules will be amended to remove the reference to such margin.

d. Benchmarking

1. **Changes to the Initial Margin methodologies and certain Additional Margins**

For these changes, CDCC has completed a review of the risk methodologies used by five central counterparties, namely LCH Clearnet Ltd, CME Group, ICE Clear US/ICE Clear Europe, Eurex Clearing and ASX Clear (Futures).

(i) Change from a SPAN methodology to a Value-at-Risk (VaR) methodology for Fixed Income Transactions

All central counterparties reviewed have adopted a similar approach to calibrate the Initial Margin for Fixed Income Transactions. Despite the fact that the scope of the Fixed Income products covered in this benchmark may be different, Fixed Income Transactions react to the same market risk factors. Under the VaR approach, central counterparties use a single tailed confidence level ranging from 99.7% to 99%. To mitigate procyclicality, historical filtered VaR using a volatility floor seems to be the most favored method, with an EWMA volatility estimator. Another method proposed for procyclicality consists of assigning at least 25% weight to stressed observations in the look-back period. One counterparty has implemented the expected shortfall statistical method. The look-back period varies from three (3) years to ten (10) years.

(ii) Change in the Close-out period (Margin Period of Risk)

All central counterparties use a predetermined fixed Close-out Period applicable at the asset class level (e.g. equity futures, fixed income products, OTC derivatives). For most central counterparties, an asset class level refers to a group of products that could be liquidated or auctioned together following the default of a participant. In general, the Close-out Period for the most liquid products are margined using one (1) day to three (3) days. Less liquid products, such as OTC derivatives and commodities, would theoretically take more time to close-out and are hence associated to a longer Close-out Period (generally four (4) to seven (7) days).

(iii) Change to the Additional Margin for Concentration Risk (or Market Liquidity Risk)

Despite the fact that this margin surcharge is not fully implemented at all central counterparties or not considered for certain types of products, certain central counterparties have or are expected to implement an Additional Margin for Concentration Risk. This surcharge is generally based on the volume, the type of products (OTC versus exchange-traded products), the open interest and the volatility of the products. Similar to the Close-out Period methodology, the surcharge is usually applied at the product group level. Some central counterparties are however using a more granular approach at the product level. For all central counterparties, a more concentrated position in a product or a group of products leads to a higher charge. This surcharge is typically calibrated using a multiplier against the Base Initial Margin. Market liquidity and concentration risk are often taken into consideration in a integrated way, since they are related to the market impact of liquidating a large position, over the Close-out period, following the default of a participant.

(iv) Change to the Additional Margin for Specific Wrong-Way Risk

Some central counterparties mitigate the specific WWR by adding a margin surcharge for positions on products (such as options or futures on shares) associated with the Clearing Member's Underlying Interest exposure in its own company or affiliates. The methodology is based on the assumption that the Underlying Interest goes to zero. One central counterparty calculates this risk on a net basis, by netting this risk with the corresponding specific right-way risk. Other central counterparties use a monitoring approach where a Clearing Member's exposure triggers the WWR limits. Rule-based actions are taken by the central counterparties to decrease or prevent this exposure.

(v) Change to the Additional Margin for Mismatched Settlement Risk; Change to the Additional Margin for Intraday Variation Margin Risk; Introduction of a new Additional Margin for Unpaid Option Premium

Notwithstanding our efforts to gather information from other central counterparties on these various types of additional margins, given the lack of public information, CDCC was not in a position to conduct a relevant benchmarking review.

(vi) Introduction of a new Additional Margin for Banking Holiday Risk

A similar additional margin is requested by some central counterparties when they are exposed to the risk arising when it is impossible to collect cash settlement from Clearing Members while some markets segments are open for trading and/or clearing. In this situation, two main approaches seem to be used by the central counterparties. The first approach consists on calling an intra-day margin prior to the previous business day cut-off time; this methodology considers each participant's largest intraday liability over the previous month. The second approach consists on temporarily increasing the holding period of the exposed products in order to cover an additional closing-day period.

(vii) Changes impacting the SPAN methodology for Options

Based on the analysis conducted by CDCC, all central counterparties use the Volatility Scan Range parameter to assess the maximum change reasonably likely to occur for the implied volatility of the Options. In general, this parameter is applied at the Combined Commodity level and modeled from a parametric or non-parametric approach using the observed historical implied volatilities of selected strike prices and expirations. Some central counterparties also use a flat fixed rate per asset class or market sectors for equities.

(viii) Changes impacting the Additional Margin for Capital Risk

Some central counterparties mitigate this type of risk by imposing higher minimum capital requirements. Except for the foregoing, CDCC was not in a position to conduct a more detailed benchmarking on this topic.

2. **Changes to the Clearing Fund methodology**

Central counterparties do not publicly share anything, or share very little information, on how they measure and capture their intra-day risk in their Clearing Fund. However, CDCC has noticed that some central counterparties use different methodologies to assess the appropriate Clearing Funds size (use of a buffer or other mechanism to resize the Clearing Fund at certain level of Clearing Fund consumption). Except for the foregoing, CDCC was not in a position to conduct a more detailed benchmarking on this topic.

III. IMPACTS ON TECHNOLOGICAL SYSTEMS

It goes without saying that, by its nature, the implementation of the NRS has various impacts on CDCC's systems. This aspect of the project will be subject to a *Significant Change Notice* addressed to the Bank of Canada and to a notification for a significant change to CDCC's systems addressed to the Autorité des marchés financiers and the Ontario Securities Commission.

As previously mentioned, the implementation of the NRS is part of a multi-year modernization project. Since November 2017, TMX Group put in place a Post Trade Modernization group that provides various and relevant stakeholders (Clearing Members, their service providers, regulators, etc.) with updates on the project progress, milestones and upcoming developments. Moreover, various sub-committees dealing with different issues have been created in order to tackle specific questions more efficiently with the right stakeholders. With respect to the first phase of the modernization project covered by the current analysis, CDCC's preliminary view is that, notwithstanding the risk and operational changes contemplated by the implementation of the NRS, there will be very few technological impacts on the Clearing Members and their service providers, and all potential system changes have been shared with the relevant stakeholders through the sub-committees. CDCC will continue its engagement with the Clearing Members and their service providers along the course of the project, in order to ensure operational readiness.

IV. OBJECTIVES OF THE PROPOSED MODIFICATIONS

In 2017, TMX Group decided to modernize the technology underlying its clearing platforms and the related financial risk-management system. The overall objective of this major project is to improve and enhance risk management by replacing aging technology, reducing the need for manual processes and strengthening the risk models used by CDCC in its day-to-day activities. The project is also expected to provide CDCC with greater flexibility in its clearing and risk-management systems, allowing such systems to better adjust to evolving clearing and risk standards and requirements. CDCC also wishes to upgrade its risk management processes based on the recent guidance issued by CPMI-IOSCO in the Resilience Report. This guidance provides additional clarity on certain aspects of the *Principles for market infrastructure* ("PFMIs") for central counterparties.

V. PUBLIC INTEREST

CDCC is of the view that the proposed amendments are not contrary to the public interest. In fact, the public and Clearing Members are generally requesting clear rules that are consistent with the best practices of other clearing houses and are PFMI compliant. CDCC continues to achieve such objectives by (1) implementing a NRS that will enhance CDCC's flexibility to add or modify risk methodologies, and (2) improving its risk methodologies in compliance with the PFMIs.

VI. MARKET IMPACTS

1. Changes to the Margin methodologies and certain Additional Margins

<u>Change from a SPAN methodology to Value-at-Risk (VaR) methodology for Fixed Income Transactions</u>

For Fixed Income Transactions, under the new methodology, the Base Initial Margin could be higher or lower than Base Initial Margin of the current methodology depending on the portfolio composition of the Clearing Member and the historical market conditions at the time the risk measures are calculated. This is mainly explained by the additional diversification offered by the VaR methodology (full netting compared to partial margin relief for SPAN), the look-back period (5 years compared to 1 year for SPAN), the computation method (non-parametric compared to parametric for SPAN) and the type of margin floor (usage of a margin buffer versus a 10 year floor for SPAN).

On average, an increase of 3% of the Base Initial Margin would have been observed at the CDCC level during 2017 if the new methodology had been used.

The additional impact to the Clearing Fund related to the implementation of the VaR methodology is very minor.

Change to the Close-out Period (Margin Period of Risk) and the Additional Margin for Market Liquidity Risk (currently known as Additional Margin for Concentration Risk)

The impacts of the change in MPOR and the way CDCC measures its inherent market liquidity and concentration risks need to be analyzed together. Indeed, the inherent market risk, which is currently embedded in the MPOR and therefore in the Base Initial Margin, will now be part of the Additional Margin for Market Liquidity Risk. When one compares the total 2017 Margin requirement of the Base Initial Margin with the Additional Margin for Concentration Risk versus the proposed Base Initial Margin with the Additional Margin for Market Liquidity Risk, one can conclude that, on average, the same amount of margin would have been required from Clearing Members. This is coherent with an expected lower proposed Base Initial Margin (from a reduction of the MPOR for some products) and an higher proposed Additional Margin for Market Liquidity Risk (mainly from the addition of the inherent market liquidity risk). On average during 2017, 50M$ of Base Initial Margin would have been transferred to the Additional Margin for Market Liquidity Risk.

Moreover, since the change in MPOR impacts the size of the Base Initial Margin, an enhancement in the MPOR calculation would also impact the Clearing Fund size. However, considering the lower level of exposure on products which have a MPOR above two (2) days, the impact of the MPOR methodology change on the Clearing Fund is not material.

Change to the Additional Margin for Specific Wrong-Way Risk

The market impact of the change to the Additional Margin for Specific Wrong-Way Risk can be simply summarized by the two main modifications proposed by CDCC which result in opposite consequences on the margin requirement. While the calculation of the wrong-way risk using a net approach (by considering the right-way risk) reduces the Margin Requirement on the one hand, keeping the wrong-way risk positions to calculate the Base Initial Margin increases the Margin requirement on the other hand. Hence, depending on the directionality of the portfolio of a Clearing Member, the value of this additional margin may increase or decrease compared to the value that would be obtained with the current methodology. If this methodology had been used in 2017, the additional margin at the CDCC level would have decreased by 8%.

Change to the Additional Margin for Mismatched Settlement Risk

If this methodology had been used in 2017, the additional margin at the CDCC level would have increased by 48 %.

Change to the Additional Margin for Intraday Variation Margin Risk

If this methodology had been used in 2017, the additional margin at the CDCC level would have decreased by 43 %.

Introduction of a new Additional Margin for Unpaid Option Premium Risk

Based on the observed Clearing Members' daily end-of-day Unpaid Option Premium for 2017, the average margin increase at the CDCC level was assessed at 0.73% relative to the Base Initial Margin for Options and 0.073% relative to the Base Initial Margin for all products.

Introduction of a new Additional Margin for Banking Holiday Risk

In 2017, the current methodology increased the margin requirements by 16.8% on the day preceding the Banking Holiday. CDCC has performed an impact analysis on every Clearing Member and concluded that if the proposed methodology had been used in 2017, the additional margin would have increased from 16.8% to 21.0%.

Changes impacting the SPAN methodology for options

For 2017, at the CDCC level, the Base Initial Margin for equity Options would have increased on average by 12% following the activation of the VSR, as proposed by CDCC. However, the Base Initial Margin would have increased on average by only 3% for all products under the SPAN methodology (excluding Fixed Income Transactions) since Futures Contracts are not impacted.

The additional impact to the Clearing Fund related to the implementation of the VSR activation is very small.

Changes impacting the the Additional Margin for Capital Risk

If this methodology had been used in 2017, the additional margin at the CDCC level would have decreased by 19%.

Please note that for all additional margins there is no impact on the Clearing Fund since these additional margins are not included in the calibration of the Clearing Fund.

2. Changes to Clearing Fund methodology

The introduction of a new resizing methodology will provide CDCC with a more proactive way to manage its credit exposure, enabling CDCC to increase the size of its Clearing Fund before it actually experiences a Cover-1 breach. This new methodology is potentially impacting the number of intra-month resizing events, the level of the Clearing Fund consumption and the level of the Clearing Fund.

To assess the market impact of this change, CDCC applied the proposed methodology to actual data between May 2015 and November 2017 (i.e. over a two and half year period). The analysis showed that during this period, the number of Clearing Fund resizings increased from 4 to 13. Also, the average Clearing Fund size consumption decreased by 1.4%, while the average Clearing Fund size increased by 1.6%. However, CDCC was able to witness the main benefit of this methodology as the number of Cover-1 breaches was reduced by 75% from 4 to only one breach.

To ensure compliance with the Resilience Report, CDCC has also revised the number of stress test scenarios and their calibration, and updated how the aggregation method is applied. Based on 2017 data (including the margin risk methodology changes), the Clearing Fund size with the new methodology is on average 11.5% higher than with the current methodology, increasing the fund by $126 million. This growth is mainly explained by the new methodology related to the P&L aggregation (96.5% of this impact).

VII. PROCESS

The proposed amendments are to be submitted for approval to CDCC Board of Directors. After Board approval has been obtained, the proposed amendments, including this analysis, will be transmitted to the Autorité des marchés financiers in accordance with the self-certification process, and to the Ontario Securities Commission in accordance with the "Rule Change Requiring Approval in Ontario" process. The proposed amendments and analysis will also be submitted for approval to the Bank of Canada in accordance with the Regulatory Oversight Agreement.

VIII. EFFECTIVE DATE

The changes proposed in this analysis will become effective during the first quarter of 2019.

IX. ATTACHED DOCUMENTS

Appendix 1: Risk Manual, proposed changes;
Appendix 2: Operations Manual, proposed changes.
Appendix 3: Rules, proposed changes.

RISK MANUAL

~~OCTOBER 5, 2018~~

Risk Manual

Table of Contents

Glossary

~~Capitalized terms not~~Unless otherwise defined in this Risk Manual~~-~~, capitalized terms shall have the meanings given to them in the Rules.

Adjusted Base Initial Margin: With respect to Limited Clearing Members, the Base Initial Margin is multiplied by the Effective Ratio. The Effective Ratio is recalibrated on a regular basis as provided in this Manual.

~~**Active Scenario:** The maximum likely loss scenario in the SPAN® risk analysis.~~

Additional ~~Margins:~~Margin(s): Additional Margins are added to the Base Initial Margin (or Adjusted Base Initial Margin, where applicable) to form part of the Initial Margin in accordance with the methodology set out in this Manual. The Additional Margins include the following: (1) Additional Margin for ~~Concentration~~Market Liquidity Risk, (2) Additional Margin for Specific Wrong-Way Risk, (3) Additional Margin for Mismatched Settlement Risk, (4) Additional Margin for Intra-Day Variation Margin Risk, (5) Additional Margin for Unpaid Premium Exposure Risk, (6) Additional Margin for Banking Holiday Risk, (7) Additional Margin for Variation Margin Delivery Risk, (~~6~~8) Additional Margin for Capital ~~Margin, (7~~Risk, (9) Additional Margin for Uncovered Risk of Limited Clearing Members and (~~8~~10) any other additional Margins as set out in the Rules (other than ~~Margin~~ required pursuant to Rule D-607). When used in the singular form, Additional Margin shall refer to one of the Additional Margins described above, whenever the context so requires.

~~**Additional Capital Margin:** This Margin Requirement~~**Additional Margin for Banking Holiday Risk**: The Additional Margin for Banking Holiday Risk covers the risk of uncovered exposures arising from new trades during the Banking Holiday and the additional market risk that the Corporation could face during the Banking Holiday.

Additional Margin for Capital Risk: This Margin requirement covers the credit risk of the Clearing Members that arises if the exposure of a Clearing Member to the Corporation is greater than the Clearing Member's capital level.

~~**Additional Margin for Concentration Risk:** This Margin Requirement covers the risk that arises from sizeable positions which cannot, due to their size compared to the total of open positions in a product or a group of products, be liquidated within the pre-defined Close-out Period for the product or group of products, leading to a longer Close-out Period for that Clearing Member.~~

Additional Margin for Intra-day Variation Margin Risk: This Margin ~~Requirement~~requirement covers the intra-day risk arising in circumstances in which market volatility or surges in trading volumes produce unusually large Variation Margin exposures.

Additional Margin for ~~Uncovered~~Market Liquidity Risk ~~of Limited Clearing Members~~: This Margin ~~Requirement~~requirement covers the liquidity risk ~~exposure that arises if the total value of the risk represented by an LCM to~~ arising when the Corporation ~~is greater~~has to close-out positions at a price different than the ~~aggregate amount of~~market price. This liquidity risk could be divided into two components: the first one is the inherent market liquidity risk which is mainly associated to the ~~Limited Clearing Member's Adjusted Base Initial Margin~~bid-ask spread, and the ~~total value of the Clearing Fund.~~

~~The risk represented by~~second one is the additional liquidity risk due to concentrated positions that cannot be liquidated within the ~~LCM is determined by the Corporation by calculating the estimated loss that the Corporation would face in extreme but plausible market conditions. This Additional Margin is calculated on a daily basis and is required from Limited Clearing Members only~~bid-ask spread.

Additional Margin for Mismatched Settlement Risk: This Margin ~~Requirement~~requirement covers the risk arising from a lag between the settlement of positions which otherwise ~~result~~results in a ~~Margin~~margin offset.

Additional Margin for Specific Wrong-Way Risk: This Margin ~~Requirement~~requirement covers the risk that arises when the exposure of a Clearing Member in its own products is adversely correlated with the creditworthiness of that Clearing Member.

Additional Margin for Uncovered Risk of Limited Clearing Members: This Margin requirement covers the risk exposure that arises if the total value of the risk represented by an LCM to the Corporation is greater than the aggregate amount of the Limited Clearing Member's Adjusted Base Initial Margin and the total value of the Clearing Fund.

The risk represented by the LCM is determined by the Corporation by calculating the estimated loss that the Corporation would face in extreme but plausible market conditions. This Additional Margin is calculated on a daily basis and is required from Limited Clearing Members only.

Additional Margin for Unpaid Option Premium Exposure Risk: The Additional Margin for Unpaid Option Premium Exposure Risk covers the risk incurred by the Corporation in guaranteeing to each Clearing Member the settlement of the Net Daily Premium on a daily basis.

Additional Margin for Variation Margin Delivery Risk: The Additional Margin for Variation Margin Delivery Risk covers the risk incurred by the Corporation in guaranteeing to each Clearing Member having pledged specific securities to cover its Net Variation Margin Requirement, the return of such specific securities, in the event that another Clearing Member to which the specific securities were initially delivered fails to return such specific securities and becomes Non-Conforming or is Suspended. In this case, the Corporation will have to buy the specific securities in the market to return to the Clearing Member that had initially pledged the specific securities.

~~**Adjusted Base Initial Margin:** With respect to Limited Clearing Members, the Base Initial Margin multiplied by the Effective Ratio.~~ **Banking Holiday**: Remembrance Day, in Canada, or any day determined as Remembrance Day by the Corporation through its Holiday Schedule published on a yearly basis.

~~The Effective Ratio is recalibrated on a regular basis as provided in this Manual.~~

Base Initial Margin: The Base Initial Margin requirement covers the potential losses that may occur over the next liquidation period as a result of market fluctuations. The Base Initial Margin ~~is calculated by the Risk Engine and~~ does not include any Additional Margins.

Boundaries: With respect to the Effective Ratio, the Boundaries refer for a specific period to the upper limit (UB) and lower limit (LB) which are respectively the highest and lowest Daily Ratios during such period.

~~**Buckets:** All Acceptable Securities of Fixed Income Transactions that behave in a similar manner are grouped together into "Buckets" and each Bucket behaves as a Combined Commodity. Acceptable Securities are bucketed according to their remaining time to maturity and issuer. Due to the nature of the bucketing process, the Acceptable Securities' assignation will be dynamic in that they will change from one Bucket to the other as the Acceptable Security nears maturity.~~

~~**Clearing Engine:** The Corporation uses SOLA® Clearing as its Clearing Engine.~~

~~**Clearing Fund**: has the meaning given thereto in Section A-102 of the Rules.~~

Clearing Fund Requirement: The Clearing Fund Requirement constitutes the required contribution to the Clearing Fund for each Clearing Member (excluding Limited Clearing Members).

~~**Close-out Period or Liquidation days:** The period required by the Corporation to unwind the positions in a particular contract without moving the market due to the liquidation of positions.~~

Combined Commodity: ~~The Risk Engine divides the positions in each portfolio into groupings called Combined Commodities. Each Combined Commodity may represent all positions on~~Group of positions that are associated with the same ~~ultimate~~ Underlying Interest or product or both. Combined Commodity is the lowest level at which the Base Initial Margin for Options, Futures and Unsettled Items is computed.

Daily Ratio: The Daily Ratio is determined, for any Business Day, by dividing the total amount of Clearing Fund Requirements on that Business Day by the aggregate amount of the Base Initial Margin ~~requirements~~requirement of all Clearing Members (other than Limited Clearing Members) on the same Business Day.

~~**Derivative Instrument:** has the meaning given thereto in Section A-102 of the Rules.~~

Effective Ratio: Ratio established by the Corporation, in accordance with the governance standards set forth in this Manual, which reflects the multiplier applicable to the Base Initial Margin for Limited Clearing Members.

~~**Floating Price Rate:** has the meaning given thereto in Section D-601 of the Rules.~~

Expected Shortfall: Average of all losses which are greater than or equal to the worst case. The worst case represents the (1-α)% case, where α is the confidence level.

Haircut: Percentage discounted from the market value of eligible collateral pledged for Margin Deposit. The discount reflects the price movement volatility of the collateral pledged.

Historical Filtered Scenarios: Set of scenarios resulting of a weight applied to the Historical P&L Scenarios to reflect the current volatility. The current volatility is estimated by applying a volatility scaling adjustment using the the exponentially weighted moving average (EWMA).

Historical P&L Distribution: Ranking of the Historical P&L Scenarios from the largest loss to the largest profit.

Historical P&L Scenarios: Set of scenarios for a Fixed Income Transactionrepresenting the hypothetical gains and losses derived from Historical Filtered Scenarios. The gains and losses are created by calculating the difference between the price the Fixed Income Transactionunder an Historical Filtered Scenario and the initial reference price.

Historical Scenarios: Set of scenarios for a Risk Factor and representing an hypothetical market observation movement reasonably likely to occur, from the current situation to a specific point in time in the future.

Inter-Commodity ~~**Spread Charge**~~**:** Portfolio containing offsetting positions ~~(identified as "Inter-Commodity Spread")~~ in highly correlated instruments are subject ~~in the Risk Engine~~ to credits which reduce the overall Base Initial Margin~~.~~ for Options, Futures and Unsettled Items.

Initial Margin: The Initial Margin is composed of the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) and the Additional Margins.

Intra-Commodity ~~**(Inter-Month) Spread Charge:** Underlying Interests' prices, from a~~ **:** Portfolio containing offsetting positions in different maturity month in the same Combined Commodity are subject to ~~another~~a charge since they may not be perfectly correlated. ~~Gains on a maturity month should not totally offset losses on another maturity month. To cover the risk of calendar spread positions, an Intra-Commodity (Inter-Month) Spread Charge can be set in the Risk Engine.~~

~~**Limited Clearing Members (LCMs):** has the meaning given thereto in Section A-102 of the Rules.~~

~~**Liquidity Interval:** The Liquidity Interval is calculated based on the historical bid-ask price spread of the Underlying Interest according to the same formula as for Margin Interval.~~

~~**Margin Deposits:** has the meaning given thereto in Section A-102 of the Rules.~~

Margin Buffer Multiplier: Multiplier to the Base Initial Margin for Fixed Income Transaction to prevent and control potential procyclical effects.

Margin Interval~~**:**~~ **(MI):** Parameter established by the Corporation which reflects the maximum price fluctuation that the Underlying Interest could be expected to have during the ~~liquidation period.~~MPOR. The ~~Margin Interval~~MI is used to calculate the Base Initial Margin ~~of every Derivative Instrument~~for Options, Futures and ~~OTCI~~Unsettled Items.

Margin ~~**Requirement:** Any amount~~**Period** **of** ~~Margin that may be~~**Risk (MPOR):** The period required ~~under Rule A-7 in accordance with~~by the ~~methodology set forth in this Manual, including Initial Margin and Variation Margin.~~

~~**Net Variation Margin Requirement:** has~~Corporation to close-out non-concentrated positions in a particular contract (or either through liquidation, auction or by hedging or neutralizing the ~~meaning given thereto in Section D-601 of the Rules.~~

~~**Over-The-Counter Instrument (OTCI):** has the meaning given thereto in Section A-102 of the Rules.~~market risk).

Price Scan Range~~**:**~~ **(PSR):** The maximum price movement reasonably likely to occur, during a specified timeframe.

Risk Array: A Risk Array ~~(RA)~~ is a set of scenarios defined ~~in the Risk Engine~~ for a particular contract and representing the hypothetical gain/loss under a specific set of market conditions from the current situation to a specific point in time in the future.

Risk Factor: Factor influencing the value of a Derivative Instrument or OTCI.

Risk Engine: The system used by the Corporation ~~uses the Standard Portfolio Analysis system (SPAN®) as its Risk Engine~~for risk management, risk measurement and calculation of Initial Margin and Clearing Fund Requirement.

Rules: means the Rules of the Corporation, including the Operations Manual and this Manual, as any such rules and manuals may from time to time be amended, changed, supplemented or replaced in whole or in part.

Scanning Risk: The ~~Risk Engine chooses the~~ difference between the current market value of an Underlying Interest and its most unfavourable projected liquidation value obtained by ~~varying~~shocking the values of the Underlying Interest according to several scenarios representing adverse changes in normal market conditions.

Short Option Minimum ~~**(SOM):**~~: Amount included in the Base Initial Margin to cover the risk exposure arising from deep out-of-the-money short option positions. This amount is required if ~~the SOM~~this amount is higher than the result of the Risk Arrays.

~~**Uncovered Residual Risk (URR):** has the meaning given thereto in Section A-102 of the Rules.~~

~~**Underlying Interest:** has the meaning given thereto in Section A-102 of the Rules.~~

~~**Unsettled Item**: Any delivery of the Underlying Interest that has not been settled at the Central Securities Depository.~~

Variation Margin: The Variation Margin covers the risk due to the change in price of a Derivative Instrument or of an OTCI or a change in the Floating Price Rate, in each case since the previous evaluation in accordance with the Rules.

VaR Risk Group(s): Group of Fixed Income Transactions that are associated to similar Risk Factors. VaR Risk Group is the lowest level at which the Base Initial Margin for Fixed Income Transactions is computed.

Volatility Scan Range~~:~~ **(VSR):** The maximum ~~change~~implied volatility movement reasonably likely to occur ~~for the volatility of each Option's (including an OTCI Option's) Underlying Interest price~~, during a specified timeframe.

~~**Some of the terms and concepts herein defined, as used in this Risk Manual, are derived from the CME Group proprietary SPAN® margin system, adapted for CDCC's licensed use thereof.**~~

Volatility Shock(s): Parameter established by the Corporation which reflects the maximum daily volatility fluctuation that the Option contract.. The Volatility Shock is used to calculate the Base Initial Margin for Options.

Zero Curve: Specific type of yield curve that associates interest rates on zero coupon bonds to different maturities (tenors). Tenors represent the Risk Factors inputs to evaluate the price of a Fixed Income Transaction using a full revaluation method.

Section 1: Margin Deposits

As set out in the Rules, every Clearing Member shall be obligated to deposit Margin with the Corporation, as determined by the Corporation. Deposits must be made in the form of eligible collateral, as specified in Section 2 of this Risk Manual, in an amount sufficient, taking into account the market value and applicable Haircuts.

The Corporation requires Margin Deposits to cover two types of requirements, namely:

- Margin ~~Requirement~~requirement; and
- Clearing Fund Requirement.

1.1 MARGIN REQUIREMENT

The Margin ~~Requirement~~requirement is composed of the Initial Margin and the Variation Margin.

1.1.1 Initial Margin

The Initial Margin is composed of the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) and the Additional Margins. In order to cover the Initial Margin described below, Clearing Members shall deliver to CDCC an acceptable form of Deposits in accordance with Section 2 of this Risk Manual.

1.1.1.1 Base Initial Margin

The Base Initial Margin requirement covers the potential losses and market risk that may occur as a result of future adverse price ~~movements~~and/or Risk Factors across the portfolio of each Clearing Member under normal market conditions. ~~Specifically, the Corporation uses a volatility estimator and a confidence level over 99% under the Normal distribution or the Student's t-distribution assumption.~~

The ~~Corporation also considers a variable number of days as an acceptable liquidation period. The Base Initial Margin amount is calculated using~~risk methodology for the Options, Futures and Unsettled Items incorporates the historical volatility of the daily price returns of the Underlying Interests for Options ~~contracts~~, Unsettled Items and Share Futures~~,~~ and the daily price returns of the Futures prices for Futures

~~contracts~~ (excluding Share Futures~~) and the yield-to-maturity (YTM) daily variation of the on-~~). In addition, as part of the methodology, the Corporation uses a volatility estimator, a confidence level over 99% under the normal distribution or the student's t-distribution assumption and a variable number of days as the~~-run security~~ MPOR.

The risk methodology for Fixed Income Transactions[1]~~.~~ is the Value at Risk methodology (VaR)[2]. This methodology considers a full revaluation method and it is based on Zero Curves. In addition, as part of the methodology, the Corporation uses a volatility estimator, a Margin Buffer Multiplier to prevent a large decrease in Margin requirements during periods of low volatility, a confidence level over 99% and a variable number of days as the MPOR.

Please refer to ~~Section~~Sections 6.1 and 6.2 for additional details on the Base Initial Margin calculation.

With respect to the Limited Clearing Members, the Base Initial Margin is multiplied by the Effective Ratio to calculate the Adjusted Base Initial Margin. Please refer to Section 6.~~2~~3 for additional details on Effective Ratio Recalibration.

1.1.1.2 Additional Margins

In addition to the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be), the Corporation requires Margin Deposits for the following Additional Margins:

(1) Additional Margin for ~~Concentration~~Market Liquidity Risk

(2) Additional Margin for Specific Wrong-Way Risk

(3) Additional Margin for Mismatched Settlement Risk

(4) Additional Margin for Intra-day Variation Margin Risk

~~1 The same methodology used for Fixed Income Transactions is applied for physical delivery of Government of Canada Bond Futures (CGB, CGZ, CGF and LGB).~~

2 The same methodology used for Fixed Income Transactions is applied for physical delivery of Government of Canada Bond Futures.

(5) Additional Margin for Unpaid Option Premium Exposure Risk

(6) Additional Margin for Banking Holiday Risk

~~(5)~~(7) Additional Margin for Variation Margin Delivery Risk

~~(6)~~(8) Additional Capital Margin Risk

~~(7)~~(9) Additional Margin for Uncovered Risk of Limited Clearing Members

~~(8)~~(10) ~~any~~Any other additional Margins ~~as set out in the Rules (other than Margin required pursuant to Rule D-607).~~

ADDITIONAL MARGIN FOR ~~CONCENTRATION~~MARKET LIQUIDITY RISK

As mentioned in Section 1.1.1.1, the Base Initial Margin requirement is intended to cover potential portfolio losses ~~over an acceptable Close-out Period. Close-out Periods are set on a product specific basis and depend especially on their liquidity. For sizeable positions which cannot, due to their size compared to the total of open positions in a product or a group of products, be liquidated within the pre-defined Close-out Period for the product or group of products, leading to a longer Close-out Period for that Clearing Member, CDCC will require~~and market risk over a variable number of days defined as the MPOR. This Additional Margin ~~for Concentration Risk. The Concentration Risk methodology will add a number of liquidation day(s) to~~covers the liquidity risk arising when the Corporation has to close-out positions at a price different than the ~~pre-defined Close-out Period that will be applied to the incremental positions that are above a certain threshold.~~ market price.

The Additional Margin for Market Liquidity Risk methodology will consider an absolute surcharge or a relative surcharge for positions exceeding pre-determined thresholds.

The absolute surcharge is a fixed dollar amount applied on a specific contract or transaction or a group of contracts or transactions. The relative surcharge is applied against the specific Base Initial Margin of the specific contract or transaction or a group of contracts or transactions.

The thresholds are determined based on ~~the average~~ quantitative adjustments such as the trading volume of the product~~.~~[3] or Underlying Interest, the volatility of the product or Underlying Interest, and the average amount of bids in the primary market auctions for real return bonds. In addition to these adjustments, the Corporation may also apply qualitative adjustments.

~~For example, let's assume that CDCC sets a threshold for a specific product with a default Close-out Period of two (2) days at 2500 contracts and the Clearing Member net position is 8000 contracts, CDCC will perform a first Margin run with a number of liquidation days equal to two (2) (the default Close-out Period of this product) for the first 5000 contracts (5000 = 2500 * 2) and a second Margin run with a number of liquidation days equal to 3 (the default Close-out Period of this product incremented by one (1) day) for 2500 contracts (i.e. the one day threshold) and a third Margin run with a number of liquidation days equal to 4 (the default Close-out Period of this product incremented by two (2) days) for 500 contracts (i.e. the remaining position: 500 = 8000 - 5000 - 2500). The Additional Margin for Concentration Risk is the sum of the Margin runs.~~

~~The position thresholds are determined as described below:~~

~~**Product**~~	~~**Threshold methodology**~~
~~Options~~	~~Average trading volume of the Underlying Interest over a certain period of time.~~
~~Futures (excluding Share Futures)~~	~~Average trading volume of the product over a certain period of time.~~
~~Share Futures~~	~~Average trading volume of the Underlying Interest over a certain period of time.~~

[3] ~~For Real Return Bonds, the threshold is based on average amount of bids in the primary market auctions for Real Return Bonds.~~

~~Fixed Income Transactions (excluding Real Return Bonds)~~	~~Average trading volume of the product over a certain period of time.~~
~~Real Return Bonds[4]~~	~~Average amount of bids in the primary market auctions for Real Return Bonds.~~

The threshold and surcharge values are updated by CDCC from time to time.

ADDITIONAL MARGIN FOR SPECIFIC WRONG-WAY RISK

~~The~~The risk covered by the Additional Margin for Specific Wrong-Way Risk arises when the exposure of a Clearing Member in its own products[5] is adversely correlated with the credit worthiness of that Clearing Member. The Additional Margin for Specific Wrong-Way risk aims to measure the risk exposure that represents the net wrong-way exposure less any eligible right-way exposure. For each situation described in the section below, the right-way exposure is limited to the value of the wrong-way risk exposure.

CDCC has identified ~~three~~four particular situations where the ~~Specific Wrong-Way Risk~~risk exists:

- Call Options: When a Clearing Member holds a long Call Option position on the shares issued by itself or its Affiliates, the Option Price or the OTCI Option Price for OTCI Securities Options, as the case may be, is charged as Additional Margin for Specific Wrong-Way Risk. However, the value of all short Call Options for which the Underlying Interest is a security issued by itself or its Affiliates will reduce the amount charged as Additional Margin for Specific Wrong-Way Risk.

~~4 For Real Return Bonds, the threshold is applied at the asset class level.~~

5 Positions on a security issued by the Clearing Member or its Affiliates or positions for which the ~~underlying interest~~Underlying Interest is a security issued by the Clearing Member or its Affiliates.

- Put Options: When a Clearing Member holds a ~~Short~~short Put Option position ~~on the shares of~~for which the Underlying Interest is a security issued by itself or its Affiliates, the full strike value amount ~~is charged as Additional Margin for Specific Wrong-Way Risk.~~ minus the Option Price or the OTCI Option Price for OTCI Securities Options is charged as Additional Margin for Specific Wrong-Way Risk. For long Put Option position for which the Underlying Interest is a security issued by itself or its Affiliates, the Option Price or the OTCI Option Price for OTCI Securities Options minus the full strike value amount is charged as Additional Margin for Specific Wrong-Way Risk.

- Share Futures: When a Clearing Member holds a long Share Futures position ~~on the shares of~~for which the Underlying Interest is a security issued by itself or its Affiliates, the full settlement value amount is charged as Additional Margin for Specific Wrong-Way Risk. However, any short Share Futures position for which the Underlying Interest is a security issued by itself or its Affiliates will reduce the amount charged as Additional Margin for Specific Wrong-Way Risk.

- Unsettled Items: ~~The full strike value amount is charged as Additional Margin for Specific Wrong-Way Risk for Option products and the full settlement value amount is charged as Additional Margin for Specific Wrong-Way Risk for Share Futures when~~When a Clearing Member holds ~~a~~ an Unsettled Item position ~~on~~for which the Underlying Interest is a security issued by itself or its Affiliates~~.~~, the last price of the Underlying Interest is used for the calculation of the Additional Margin for Specific Wrong-Way Risk. Depending if the Unsettled Item position results from an exercise or an assignment, it could either increase or lower the Additional Margin for Specific Wrong-Way Risk.

The Additional Margin for Specific Wrong-Way Risk is netted and capped at the product level. The value cannot be lower than zero.

ADDITIONAL MARGIN FOR MISMATCHED SETTLEMENT RISK

The Additional Margin for Mismatched Settlement Risk is requested if the risk arising from a lag between the settlement of positions ~~that result~~results in a ~~Margin~~margin offset. More specifically, CDCC faces a risk that a Clearing Member settles a position that provides either a Base Initial Margin offset with other positions on the rest of the portfolio.

Given the fact that ~~Margin~~margin offsets are granted when Fixed Income Transactions portfolios have both long and short positions without taking into account the settlement dates, ~~the~~this Additional Margin charge will be calculated for the positions that could cause mismatched settlement exposure prior to a default.

In order to address ~~the Mismatched Settlement Risk~~[6]such risk, CDCC will perform forward looking analysis to forecast material changes in the Base Initial Margin as a result of settlements of Fixed Income Transactions.

The Additional Margin for Mismatched Settlement Risk will be calculated by using the maximum of several scenarios representing the potential cases that may trigger a Mismatched Settlement Risk following the settlement of positions, minus the ~~total~~ Base Initial Margin ~~for Fixed Income Transactions~~.

ADDITIONAL MARGIN FOR INTRA-DAY VARIATION MARGIN RISK

~~The~~The risk covered by the Additional Margin for Intra-Day Variation Margin Risk arises when market volatility of cleared volumes produces unusually large Variation Margin exposures. The Additional Margin for Intra-day Variation Margin Risk requirement corresponds to the sum of the Additional Margin for Intra-day Variation Margin Risk in respect of Futures and the Additional Margin for Intra-day Variation Margin Risk in respect of Fixed Income Transactions. When calculating the value of Additional Margin for Intra-day Variation Margin Risk for Futures or Fixed Income Transactions, the value cannot be lower than zero.

In order to address the Intra-Day Variation Margin Risk, ~~CDCC~~the Corporation may call for ~~additional~~Additional Margin from each Clearing Member if it determines that the intra-day exposure for Futures and/or Fixed Income Transactions ~~to~~of the Clearing Member exceeds certain

~~[6] The Additional Margin for Mismatched Settlement Risk is not applied for physical delivery of Government of Canada Bond Futures (CGB, CGZ, CGF and LGB).~~

limits (thresholds expressed in percentage) in relation to the Clearing Member's respective Base Initial Margin ~~Requirement[7] and Clearing Fund contribution.~~. The Additional Margin for Intra-Day Variation Margin Risk is subject to a minimum value (floor).

~~Since the Variation Margin for Fixed Income Transactions is calculated on a daily basis, the Intra-day Variation Margin will compare the previous Business Day's value to the current requirement. If the current requirement is less than the previous Business Day's requirement, no Additional Margin will be required.~~

~~The Additional Margin for Intra-day Variation Margin Risk requirement is the sum of the Additional Margin for Intra-day Variation Margin risk in respect of Futures and the Additional Margin for Intra-day Variation Margin risk in respect of Fixed Income Transactions.~~

ADDITIONAL MARGIN FOR UNPAID OPTION PREMIUM EXPOSURE RISK

The Additional Margin for Unpaid Option Premium Exposure Risk covers the risk incurred by the Corporation in guaranteeing to each Clearing Member the settlement of the Net Daily Premium on a daily basis. To cover this potential risk, the Corporation accumulates during the Business Day the value of the trades that are not yet settled. At the time of the calculation, if a Clearing Member is expected to make a cash settlement to the Corporation, the value is requested from the Clearing Member, as Additional Margin for Unpaid Option Premium Exposure Risk.

ADDITIONAL MARGIN FOR BANKING HOLIDAY RISK

This Additional Margin considers the risk associated to uncovered exposures arising from new trades and the additional market risk that the Corporation could face during the Banking Holiday.

The incremental exposure is based on the historical fluctuation of the Base Initial Margin requirement over a specific period and it is designed to capture the potential uncovered Base Initial Margin requirement arising from new trades during the Banking Holiday.

With respect to the additional market risk, one (1) more Business Day is added to the MPOR of the Base Initial Margin requirement for the eligible tradeable products during the Banking Holiday. This Base Initial Margin requirement is then compared to the Base Initial Margin calculated with the MPOR. The difference between the two values corresponds to the additional market risk..

ADDITIONAL MARGIN FOR VARIATION MARGIN DELIVERY RISK

This Margin ~~Requirement~~requirement covers the risk incurred by the Corporation in guaranteeing to each Clearing Member having pledged specific securities to cover its Net Variation Margin Requirement, the return of such specific securities, in the event that another Clearing Member to which the specific securities were initially delivered fails to return such specific securities and becomes Non-Conforming or is Suspended. In this case, the Corporation will have to buy the specific securities in the market to return to the Clearing Member that had initially pledged the specific securities. To cover this potential risk, an amount representing a percentage of the total Variation Margin requirement or a specific percentage set at the securities level will be collected from the Clearing Member who initially receives the specific securities, as Additional Margin for Variation Margin Delivery Risk.

ADDITIONAL CAPITAL MARGIN RISK

~~On a daily basis, the Corporation measures~~This Additional Margin intends to measure the credit exposure of all Clearing Members (excluding Limited Clearing Members) that arises if the exposure of a Clearing Member is superior to its capital amount.

~~The Additional Capital Margin is determined by the Corporation as part of the Daily Capital Margin Monitoring (DCMM) process intended to evaluate the credit risk of its Clearing Members (excluding Limited Clearing Members).~~

The Corporation compares the Clearing Member’s capital amount to the ~~sum of the~~ Base Initial Margin ~~for all products and Variation Margin requirements for Options and Unsettled Items.~~

. In the event that the ~~sum of the~~ Base Initial Margin ~~and Variation Margin requirements for Options and Unsettled Items~~ of the Clearing Member exceeds the capital amount, Additional Margin in the amount of the excess will be collected from the Clearing Member.

The capital level is derived from regulatory reports received on a regular basis. The Corporation uses the ~~Net Allowable Assets (NAA),~~net allowable assets, the ~~Net~~net Tier 1 capital or any other comparative measure to assess the capital level of each Clearing Member.

ADDITIONAL MARGIN FOR UNCOVERED RISK OF LIMITED CLEARING MEMBERS

~~This Margin Requirement covers the risk exposure that arises if the total value of the risk represented by an LCM to the Corporation is greater than the aggregate amount of the Limited Clearing Member's Adjusted Base Initial Margin and the total value of the Clearing Fund.~~

~~The risk represented by the LCM is determined by the Corporation by calculating the estimated loss that the Corporation would face in extreme but plausible market conditions. This Additional Margin is calculated on a daily basis and is required from Limited Clearing Members only.~~

This Additional Margin covers the risk exposure that arises if the total value of the risk represented by an LCM to the Corporation is greater than the aggregate amount of the Limited Clearing Member's Adjusted Base Initial Margin and the total value of the Clearing Fund.

The risk represented by the LCM is determined by the Corporation by calculating the estimated loss that the Corporation would face in extreme but plausible market conditions. This Additional Margin is calculated on a daily basis and is required from Limited Clearing Members only.

ANY OTHER ADDITIONAL MARGINS

Any other additional Margins as set out in the Rules (other than required pursuant to Rule D-607).

1.1.2 Variation Margin

The Variation Margin requirement covers the risk due to the change in price of a Derivative Instrument or ~~of~~ an OTCI or a change in the Floating Price Rate since the previous evaluation in accordance with the Rules. The following table evidences the type of Variation Margin coverage that will be required by CDCC for each type of products:

Products	Variation Margin coverage type
Options ~~contracts~~	Collateralized
Futures ~~contracts~~	Cash settled
Fixed Income Transactions	Collateralized (subject to Variation Margin process)
Unsettled Items	Collateralized

1.1.2.1 Options ~~Contracts~~

For Options ~~contracts~~, the Variation Margin is collateralized ~~daily~~every Business Day and at each Intra-Day Margin Call based on the Option Price reported by the Exchange, or the last OTCI Option Price for OTCI Securities Options[8], as the case may be, and, in the event of the unavailability or inaccuracy of such price, the Corporation shall set such price in accordance with the best information available as to the correct price.

1.1.2.2 Futures ~~Contracts~~

For Futures ~~contracts~~, the Variation Margin ~~(Gains and Losses)~~ is cash settled every Business Day based on the last Settlement Price reported by the Exchange, and, in the event of the unavailability or inaccuracy of such price, the Corporation shall set the last Settlement Price in accordance with the best information available as to the correct price.

1.1.2.3 Fixed Income Transactions

The Variation Margin Requirement[9] in respect of each Fixed Income Transaction is calculated on a daily basis and represents the sum of the Price Valuation Requirement and the Repo Rate Requirement, each as

[8] Please refer to Section 6.~~1.4.3~~ for additional details on the theoretical price calculation of OTCI Securities Options.

[9] The Variation Margin Requirement for Fixed Income Transactions is not applied for physical delivery of Government of Canada Bond Futures ~~(CGB, CGZ, CGF and LGB).~~. The applicable Variation Margin Requirement for Fixed Income Transactions is rounded up to the nearest $1 of nominal value.

defined in Section D-601 of the Rules.

PRICE VALUATION REQUIREMENT

The Price Valuation Requirement represents, in respect of a Repurchase Transaction, an amount which is the aggregate amount calculated in respect of the difference between (i) the Market Value of the Purchased Security and (ii) the Repurchase Price of the Repurchase Transaction, plus any Coupon Income payable to the holder between the calculation date and the Repurchase Date, and, in respect of a Cash Buy or Sell Trade, an amount which is the difference between (i) the Market Value of the Purchased Security and (ii) the Purchase Price of the Cash Buy or Sell Trade; which amount is owed to the Corporation by a Fixed Income Clearing Member that is a party to such Repurchase Transaction or Cash Buy or Sell Trade or by the Corporation to such Fixed Income Clearing Member.

REPO RATE REQUIREMENT

The Repo Rate Requirement represents a change in the current Floating Price Rate and means, in respect of a Repurchase Transaction, an amount which is calculated in respect of the difference between the Floating Price Rate and the Repo Rate; which amount is owed to the Corporation by a Fixed Income Clearing Member that is a party to such Repurchase Transaction or by the Corporation to such Fixed Income Clearing Member.

1.1.2.4 Unsettled Items

~~The Underlying Interest of an Option contract with physical delivery that has been exercised or assigned in the money, but is not yet settled (i.e. the Underlying Interest is not yet delivered) is considered an Unsettled Item. Similarly, the Underlying Interest of a Future contract with physical delivery that has expired is considered an Unsettled Item.~~

The Variation Margin for Unsettled Items with respect to both Options and Futures ~~contracts~~ is collateralized. With respect to Variation Margin for Unsettled Items related to Options ~~contracts~~, the Corporation calculates a Variation Margin requirement equal to the intrinsic value of the Option multiplied by the position and the contract size. With respect to Variation Margin for Unsettled Items related to Futures, the Corporation calculates a Variation Margin requirement equal to the difference between the last Settlement Price of the Futures and the ~~Price~~price of the Underlying Interest related to the Futures, multiplied by the position and the contract size.

1.1.3 Account Structure, Netting and Risk Aggregation

1.1.3.1 Short Positions, Account Types and Positions Netting

Clearing Members shall not be required to deposit Margin in respect of Short Positions in Futures or Options for which they have deposited the Underlying Interest in accordance with Section A-708 of the Rules.

The Corporation uses three types of accounts for Margin calculation purposes and positions management: Firm Account, Multi-Purpose Account and Client Account.

- For all account types, the Margin ~~Requirement~~requirement for Futures positions and Fixed Income Transactions is calculated on a net basis.
- The Margin ~~Requirement~~requirement for ~~Options positions is~~Optionsis calculated on a net basis for the Firm Account and the Multi-Purpose Account, but on a gross basis for the Client ~~Accounts~~Account, which means that only short Options~~ contracts~~ are considered when computing the Initial Margin.

1.1.3.2 Margin Aggregation

The total Margin ~~Requirement~~requirement of each Clearing Member is composed of ~~its~~the Initial Margin requirement and ~~its~~the Variation Margin requirement.

The calculation is made at the account level and then aggregated at the Clearing Member level. ~~ ~~However, operationally the Margin ~~Requirement~~requirement is subject to the following aggregation, subject to the applicable type of products being cleared by the Clearing Member:

~~1.~~ INITIAL MARGIN REQUIREMENT (including the Variation Margin for Options and Unsettled Items)

The Initial Margin requirement for all products is aggregated with the Variation Margin for Options and Unsettled Items as follows:

a) The Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) is calculated at the account level~~ and increased by both the Additional Margin for Concentration Risk and the Additional Margin for Specific Wrong-Way Risk~~. For Options, Futures and Unsettled Items, the margin results are calculated at the Combined Commodity level and the Base Initial Margin corresponds to the sum all Combined Commodities. For Fixed Income Transactions, the Base Initial Margin represents the sum of all VaR Risk Groups. The Base Initial Margin at the account level corresponds to the sum of the Base Initial Margin for Options, Futures and Unsettled Items and the Base Initial Margin for Fixed Income Transactions.

b) The Variation Margin for Options and Unsettled Items is calculated at the account level and then added to the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be~~), the Additional Margin for Concentration Risk and the Additional Margin for Specific Wrong-Way Risk.~~).

- If the Variation Margin for Options and Unsettled Items is negative, this will result in a ~~Margin~~margin credit[10] decreasing the aggregate value of the Base Initial Margin ~~(or Adjusted Base Initial Margin, as the case may be), Additional Margin for Concentration Risk and Additional Margin for Specific Wrong-Way Risk~~for Options, Futures and Unsettled Items.

- If the Variation Margin for Options and Unsettled Items is positive, this will result in a ~~Margin~~margin debit increasing the aggregate value of the Base Initial Margin ~~(or Adjusted Base Initial Margin, as the case may be), Additional Margin for Concentration Risk~~for

[10] ~~–~~ For a given account, the ~~Margin~~margin credit is capped to the ~~aggregation of the~~ Base Initial Margin ~~(or Adjusted Base Initial Margin , as the case may be)~~for Options, Futures and ~~the Additional Margin for Concentration Risk and the Additional Margin for Specific Wrong-Way Risk~~Unsettled Items.

Options, Futures and ~~Additional Margin for Specific Wrong-Way Risk~~Unsettled Items.

c) The Margin ~~Requirement~~requirement in respect of each Clearing Member is calculated by aggregating for all accounts the value of (1) the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be~~), the Additional Margin for Concentration Risk, the Additional Margin for Specific Wrong-Way Risk~~) and the Variation Margin for Options and Unsettled Items and (2) the following Additional Margins calculated at the Clearing Member level: Additional Margin for Market Liquidity Risk, Additional Margin for Specific Wrong-Way Risk, Additional Margin for Mismatched Settlement Risk, Additional Margin for Intra-Day Variation Margin Risk, Additional Margin for Unpaid Option Premium Exposure Risk, Additional Margin for Banking Holiday Risk, Additional Margin for Variation Margin Delivery Risk, Additional Capital Margin Risk, Additional Margin for Uncovered Risk of Limited Clearing Members and any other ~~Additional~~additional Margins~~.~~ as set out in the Rules.

~~2.~~ VARIATION MARGIN FOR FUTURES ~~CONTRACTS~~

The Variation Margin for Futures ~~contracts (~~(the net value of Gains and Losses) is aggregated at the Clearing Member level.

~~3.~~ VARIATION MARGIN FOR FIXED INCOME TRANSACTIONS

The Variation Margin Requirement for Fixed Income Transactions is aggregated at the Clearing Member level.

1.2 CLEARING FUND REQUIREMENT

Rule A-6 governs the rights and obligations of the Corporation and the Clearing Members, excluding Limited Clearing Members (LCMs), with respect to the Clearing Fund.

The Clearing Fund is a reserve fund put in place by the Corporation to absorb the deficit that may occur upon the default of a Clearing Member and its Affiliates when the suspended ~~CM's~~Clearing Member's prefunded financial resources do not cover its market exposure.

This fund is structured to mitigate the largest Uncovered Residual Risk ~~("URR")~~ under extreme but plausible market conditions of all Clearing Members (excluding LCMs) and of their Affiliate(s).

On a monthly basis, ~~CDCC issues~~the Clearing Fund is reviewed and updated according to ~~each Clearing Member a statement indicating the amount required by such Clearing Member to meet its Clearing Fund Requirement based on~~ the following methodology which considers two specific elements:

- The size of the Clearing Fund is based on the largest Uncovered Residual Risk ~~("URR")~~ of all Clearing Members and of their Affiliate(s) (excluding LCMs) over the last sixty (60) Business Days. The size is then increased by 15%.
- Each Clearing Member's Clearing Fund Requirement amount is equal to the weight of its respective Base Initial Margin over the last sixty (60) Business Days multiplied by the ~~total value~~size of the Clearing Fund. A Clearing Member's contribution is subject to a minimum floor (Base Deposit), which varies according to the Clearing Member's type of activity.

~~The~~On an intra-month basis, the Corporation monitors and controls the size of the Clearing Fund ~~throughout the month~~ and may adjust it upward between monthly re-evaluations. ~~The whole or a specified part~~If the largest Uncovered Residual Risk exceeds 90% of ~~this increase will be assumed by the Clearing Members, who would then receive a Margin call, depending on whether the Corporation determines that~~ the size ~~increase~~of the Clearing Fund but is ~~directly influenced by specific~~ inferior to 100% of the size of the Clearing ~~Member(s) or by general market conditions. In the latter case, the increase will be allocated among~~ Fund, the size of the Clearing ~~Members in accordance with the above~~Fund is increased by 15% of the current size. If the largest Uncovered Residual Risk exceeds 100%, the size of the Clearing Fund is updated based on the methodology~~. If the increase is attributable to both situations, the concerned Clearing Member will incur a specific increase on top of the standard allocated increase.~~

described above.

Section 2: Eligible Collateral

As set out in Section 1 of the Risk Manual, every Clearing Member shall be obligated to deposit Margin with the Corporation, as determined by the Corporation. Deposits must be made in the form of eligible collateral, as specified in this section, in an amount sufficient, taking into account the market value and applicable Haircuts.

2.1 FORMS OF COLLATERAL

The forms of eligible collateral that may be deposited by or on behalf of a Clearing Member with CDCC, as prescribed in Rule A-6 (Clearing Fund Deposits) and Rule A-7 (Margin ~~Requirements~~requirements), are one or more of the following assets:

1) Cash
2) Debt Securities
3) Valued Securities

CDCC may, on an exceptional and temporary basis at its sole discretion, exclude certain forms of eligible collateral or accept other forms of collateral.

2.2 CASH

Cash amounts are accepted only in Canadian dollars.

2.3 DEBT SECURITIES

2.3.1 General Considerations

Debt Securities which fulfill certain minimum criteria may be deemed as an eligible form of collateral.

Acceptance of a Debt Security is conditional on the availability of a price from a source that CDCC determines to be acceptable and reliable.

CDCC establishes, reviews ~~on a regular basis~~ and publishes the list of eligible Debt Securities on ~~its website~~a regular basis.

Irrespective of the fact that a Debt Security fulfils all eligibility criteria, CDCC will not accept as collateral from or on behalf of a Clearing Member any Debt Security issued or guaranteed by the Clearing Member itself or its Affiliates.

2.3.2 Types of Debt Securities

The Debt Security must be a debt instrument having a fixed and unconditional principal amount.

The coupon rate of the debt instrument must be fixed. Zero coupon bonds are eligible.

Furthermore, real return bonds can be eligible for a specific issuer as determined by CDCC on the list of eligible Debt Securities~~ published on its website.~~.

The Debt Security must not have an embedded option or carry a right of conversion into equity securities, with the exception of non-financial calls (i.e. “Canada Call”).

Saving Bonds, floating rate notes, stripped coupons and residual securities and are excluded.

2.3.3 Types of Issuers

The eligible Debt Securities must be issued or guaranteed by the Government of Canada, by a provincial government or by the United States ~~[~~(“U.S~~.]~~.”) Government.

2.3.4 Eligible Debt Securities by Issuer

2.3.4.1 Debt Securities issued by the Government of Canada:

- Treasury bills, bullet bonds and real return bonds.

2.3.4.2 Debt Securities guaranteed by the Government of Canada:

- Treasury bills, bullet bonds and Debt Securities issued by Canada Housing Trust.

2.3.4.3 Debt Securities issued by a provincial government:

- Treasury bills and bullet bonds issued by the governments of Alberta, British Columbia, Manitoba, Ontario and Quebec.

2.3.4.4 Debt Securities guaranteed by a provincial government:

- Bullet bonds issued by Financement Quebec, Hydro-Quebec and Ontario Electricity Financial Corporation.

2.3.4.5 Debt Securities issued by the U.S. Government

- Treasury bills, notes, bonds, and Treasury inflation-protected securities ~~[~~(TIPS~~].~~).

2.3.5 Settlement Procedures

Debt Securities must be transferable in book-entry form using CDSX of CDS Clearing and Depository Services Inc.

2.3.6 Currency of Denomination

Debt Securities must be denominated in Canadian dollars with the exception of Debt Securities issued by the U.S. Government denominated in U.S. dollars.

2.4 VALUED SECURITIES

2.4.1 General Considerations

CDCC accepts Valued Securities trading on the Toronto Stock Exchange or the TSX Venture Exchange.

Irrespective of the fact that a Valued Security fulfils all eligibility criteria, CDCC will not accept as collateral from or on behalf of a Clearing Member any Valued Security issued or guaranteed by the Clearing Member itself or its Affiliates.

No value will be recognized for a Valued Security whose closing price is below $10 per share.

2.4.2 Settlement Procedures

Valued Securities must be transferable in book-entry form using CDSX of CDS Clearing and Depository Services Inc.

2.4.3 Currency of Denomination

Valued Securities must be denominated in Canadian dollars.

2.5 RISK CONTROL MEASURES

2.5.1 General Considerations

The CDCC collateral ~~management~~ framework takes a conservative approach to manage the forms of eligible collateral accepted. The framework includes, but is not limited to, risk limits and calculation of Haircuts that apply to the different forms of eligible collateral.

2.5.2 Risk Limits

2.5.2.1 Limits at the Clearing Member Level

- Except for the Variation Margin account, for each acceptable Government Debt Security, excluding Treasury bills, a concentration limit equal to \$250 million or 10% of the total issue outstanding, whichever is less, is applied to each Clearing Member.
- Valued Securities issued or guaranteed by the Clearing Member or its Affiliates are not eligible.
- Valued Securities issued by the TMX Group are not eligible.

2.5.2.2 Limit on the Clearing Fund Account

For each Clearing Member, for all of its accounts combined, 100% of the Clearing Fund Requirements must be covered by Cash, acceptable Treasury bills issued by the Government of Canada or any combination thereof after the application of Haircuts.

2.5.2.3 Limit on the Margin Requirements[11]

For each Clearing Member, for all of its accounts combined, at least 25% of the Margin ~~Requirements~~requirements must be covered by Cash, acceptable Treasury bills and bonds issued or guaranteed by the Government of Canada or any combination thereof valued after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 40% of the Margin ~~Requirements~~requirements may be covered by Debt Securities issued by the United States of America Federal Government after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 50% of the Margin ~~Requirements~~requirements may be covered by provincial issued or guaranteed Debt Securities after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 20% of the Margin ~~Requirements~~requirements may be covered by Debt Securities issued or guaranteed by the province of Alberta after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 20% of the Margin ~~Requirements~~requirements may be covered by Debt Securities issued or guaranteed by the province of British Columbia after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 20% of the Margin ~~Requirements~~requirements may be covered by Debt Securities issued or guaranteed by the province of Manitoba after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 30% of the Margin ~~Requirements~~requirements may be covered by Debt Securities issued or guaranteed by the province of Ontario after the application of Haircuts.

[11] This excludes the Net Variation Margin Requirement.

For each Clearing Member, for all of its accounts combined, no more than 30% of the Margin ~~Requirements~~requirements may be covered by Debt Securities issued or guaranteed by the province of Quebec after the application of Haircuts.

For each Clearing Member, for all of its accounts combined no more than 15% of the Margin ~~Requirements~~requirements may be covered by Valued Securities after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 5% of the Margin ~~Requirements~~requirements may be covered by any one Valued Security after the application of Haircuts.

2.5.2.4 Limit on the Variation Margin Account

For each Clearing Member, for all of its accounts combined, 100% of the Net Variation Margin Requirement must be covered by acceptable Treasury bills and bonds issued or guaranteed by the Government of Canada, Government of Alberta, Government of British Columbia, Government of Ontario and Government of Quebec or any combination thereof after the application of Haircuts.

CDCC shall, on an exceptional basis, acting reasonably, accept cash or other securities as collateral to cover the Net Variation Margin Requirement.

2.5.3 Limits at CDCC Level

For each acceptable Valued Security, a concentration limit of 5% of the free float applies at CDCC level.

2.6 HAIRCUTS

2.6.1 Haircuts for Government Securities

The Corporation calculates the Haircuts based on any of the following criteria:

- Valuation of the market, credit, liquidity and foreign exchange risks based on historical daily returns;

- The volatility estimator uses the ~~-~~exponentially weighted moving average ~~(~~(“EWMA~~)~~”) approach as defined in ~~Section~~Appendix 6.~~1.1~~5, and the assumption that the bond can be liquidated at a reasonable price in “n” days. (“n” is determined according to the type of products and prevailing market conditions). In addition, a~~ minimal~~ floor for the EWMA volatility estimator is calculated as the 25th percentile of a daily EWMA volatility estimator observed over the last 10 years;
- Liquidity risk valued according to the bid-ask spread of the issues using the same EWMA volatility estimator and the floor (if this spread is unavailable, the liquidation window will be expanded and will depend on market conditions);
- Bonds of the same issuer and comparable maturities.

Once the quantitative analysis is performed, CDCC reserves the right to increase the Haircuts based on qualitative criteria, such as:

- Comparative analysis of CDCC’s Haircuts in relation to the Haircuts of the Bank of Canada;
- Comparative analysis of CDCC’s Haircuts in relation to the Haircuts of other clearing houses;
- The congruence of the different Haircuts to the credit rating spreads of the different issuers; and
- Any other factor considered relevant by CDCC, acting reasonably.

2.6.2 The Haircuts for Valued Securities

A Haircut of 50% is applied to all Valued Securities pledged against the total Margin ~~Requirement~~requirement for all accounts combined.

2.6.3 Haircuts Policy

~~The Corporation~~CDCC reviews and publishes the Haircuts ~~at least semi-annually and on an ad hoc basis if any market event occurs. The~~ from time to time, and the Clearing Members are informed of these reviews by written notice~~ and the Haircuts related to Government Securities are also published on CDCC’s website with their effective dates~~.

Section 3: Monitoring Program

3.1 BACKTESTING

~~Backtesting is performed on a daily basis by the Corporation to assess the robustness of the existing models and measure the actual credit exposures. In order to have an efficient coverage, even at the introduction of new products, the Corporation performs a complete theoretical backtesting to calibrate the liquidation period and the volatility assumption. The results of the backtesting are communicated to the Risk Management and Advisory Committee (RMAC) on a regular basis.~~

~~The Corporation has put in place appropriate internal procedures if the backtesting results are not sufficient to reach the minimum coverage at the product level and at the portfolio level. As set out in Section A-702 of the Rules, the Corporation has the discretion to adjust the Margin that may be required from Clearing Members.~~

The Corporation monitors the daily performance of the models through the backtesting and sensitivity analysis. The backtesting is used as a tool to validate the models, but it is not limited to model validation.

In addition, a Clearing Member's portfolio is backtested on a daily basis and the results are monitored by the Corporation.

3.2 STRESS TESTING

The CDCC stress testing ~~is also conducted on~~management framework takes a ~~daily basis~~conservative approach to create and revise stress tests scenarios. The Corporation uses different historical and theoretical stress scenarios, each of them designed to test different ~~key parameters. The results of the stress tests help the Corporation to size the Clearing Fund. The Clearing Fund measures the capacity of the Corporation to address extreme, but plausible market conditions~~relevant Risk Factors. The framework includes, but is not limited to, the assessment of the new scenarios and the monitoring of the Risk Factors and stress test scenarios and correction measures if the daily results are not satisfactory.

~~The results are communicated to the Risk Management and Advisory Committee (RMAC) on a regular basis.~~

The stress testing management framework is revised by CDCC from time to time.

3.3 CLEARING MEMBERS CREDIT RISK MONITORING

~~The Corporation~~CDCC performs a qualitative analysis of the financial statements of each Clearing Member. ~~The Corporation~~CDCC has defined specific thresholds to analyze the profitability, the ~~Margin required~~regulatory margin and capital obligations, the liquidity and the capital level of each Clearing Member. As a result of its analysis, the Corporation may require such additional information from its Clearing Members as may be reasonably necessary. On the basis of the above analysis, the Corporation will determine if it is necessary to take any additional actions.

~~On the basis of the above analysis, the Corporation will judge if it is necessary to take any additional actions and will report the situation to the Risk Management and Advisory Committee (RMAC).~~

Section 4: Contract Adjustment

Section A-902 of the Rules prescribes the cases in which a contract adjustment may be made.

The Corporation is responsible for monitoring and identifying the corporate events that may result in a contract adjustment. It interprets the information and communicates it to the Adjustment Committee as soon as possible. The Adjustment Committee acts in accordance with the provisions of Rule A-9.

A meeting of the ~~Adjustments~~Adjustment Committee is called by the Corporation, whenever circumstances require. The Adjustment Committee is responsible for preparing the draft notices to the Clearing Members which, once approved by the Adjustment Committee members, are published to the attention of the Clearing Members and the market participants.

Section 5: Acceptability of Underlying Interests

5.1 ACCEPTABLE UNDERLYING INTERESTS OF SECURITIES OPTIONS

- Section B-603 of the Rules sets out the eligibility criteria for Securities Options.
- Section B-604 of the Rules sets out the ineligibility criteria for Securities Options.
- Section B-605 of the Rules sets out the eligibility criteria for ETF Securities as Underlying Interests of Options.
- Section B-606 of the Rules sets out the ineligibility criteria for ETF Securities as Underlying Interests of Options.

CDCC reviews and publishes ~~quarterly~~, from time to time, the eligibility threshold and ineligibility threshold in terms of Value of Available Public Float and volume (expressed as an average daily North American Volume of the last 20 Business Days) for clearing Securities Options.

5.2 ACCEPTABLE UNDERLYING INTERESTS OF SHARE FUTURES

- Section C-1503 of the Rules sets out the eligibility criteria for Share Futures.
- Section C-1504 of the Rules sets out the ineligibility criteria for Share Futures.

CDCC reviews and publishes ~~quarterly~~, from time to time, the eligibility threshold and ineligibility threshold in terms of Value of Available Public Float and volume (expressed as an average daily North American Volume of the last 20 Business Days) for clearing Share Futures.

5.3 ACCEPTABLE UNDERLYING INTERESTS OF OTCI SECURITIES OPTIONS

- Section D-104 of the Rules sets out the acceptance criteria for OTCI Securities Options.

CDCC reviews and publishes ~~quarterly~~, from time to time, on its website a list of Acceptable Underlying Interests for clearing OTCI Securities Options.

Between two ~~quarterly~~ publications of the list of Acceptable Underlying Interests, a Clearing Member who wishes to clear OTCI Securities Options for which an Underlying Interest is not included on the list must obtain the Corporation's prior approval. The

Underlying Interest must at least meet the acceptance criteria prescribed in Section D-104 of the Rules.

5.4 ACCEPTABLE UNDERLYING INTERESTS OF CASH BUY OR SELL TRADES

For the application of Sections D-104 and D-603 of the Rules, Securities are acceptable for Cash Buy or Sell Trades clearing if they meet the following criteria:

- The issuer must be eligible, which includes the following issues:
- Bonds and Treasury ~~Bills~~bills issued by the Government of Canada, including real return issues;
- Canada Mortgage and Housing Corporation debt securities;
- Bonds issued by Business Development Bank of Canada;
- Bonds issued by Export Development Canada;
- Bonds issued by Farm Credit Canada;
- Bonds issued by Canada Post; and
- Bonds issued by certain provincial governments and provincial Crown corporations determined as acceptable by CDCC, excluding real return bonds, zero coupon bonds, and bonds with a maturity of less than one year.
  - The bonds must be repayable at maturity;
  - The bonds must be denominated in Canadian dollars;
  - The coupon type must be fixed, ~~real return~~adjusted for the inflation or zero (Treasury ~~Bills~~bills are eligible);
  - The net amount outstanding[12]~~[2]~~ must be greater than or equal to $250 million;
  - The bonds' prices must be issued by a source that is acceptable to the Corporation.

[12] The net amount outstanding is defined as the outstanding amount issued on the market minus the stripped coupon bonds and issuer repurchases.

5.5 ACCEPTABLE UNDERLYING INTERESTS OF REPURCHASE TRANSACTIONS

For the application of the provisions of Sections D-104 and D-603 of the Rules, Securities are eligible for clearing of Repurchase Transactions if they meet the following criteria:

- The Underlying Interest must be an Acceptable Underlying Interest of Cash Buy or Sell Trades;
- The Purchase Date of the Repurchase Transaction must be no earlier than the Novation Date;
- The Repurchase Date of the Repurchase Transaction must not be more than 365 days later than the Purchase Date of the Repurchase Transaction and must be no later than the maturity date of the Acceptable Security.

Section 6: Appendix

6.1 BASE INITIAL MARGIN CALCULATION FOR OPTIONS, FUTURES AND UNSETTLED ITEMS[13]

For greater certainty, this sections only applies to Options, Futures and Unsettled Items.

To calculate the Base Initial Margin~~,~~ the ~~Risk Engine uses~~risk methodology is based on the ~~Price Scan Range (~~PSR~~)~~ and the VSR which ~~is~~are then converted ~~to~~into the Scanning Risk parameter. The Scanning Risk parameter represents the difference between the ~~current market value of a Derivative Instrument (for Exchange Transactions) or of an Acceptable Security (for Fixed Income Transactions) and its~~ most unfavourable projected liquidation value and the initial reference price[14]. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others.

The Scanning Risk is ~~always~~ calculated at the Combined Commodity level~~.~~

and is denominated in the same currency as the contract. For contracts belonging to the same Combined Commodity, the Risk ~~Engine adds up the Risk Arrays~~Array results ~~of~~ are added up for all contracts under the same ~~risk~~ scenario. ~~It should be noted that in the situation where the Risk Engine does not consider other variables,~~The highest loss represents the Scanning Risk ~~is~~.

The other variables influencing the value of the Base Initial Margin ~~for the Combined Commodity~~are the Intra-Commodity, the Inter-Commodity and the Short Option Minimum. The following table summarizes the variables used in the calculation.

~~However, in some cases other variables can increase or decrease the Scanning Risk. For example, variables such as the Intra-Commodity (Inter-Month) Spread Charge which tends to increase the Base Initial Margin and the Inter-Commodity Spread Charge which tends to decrease the~~

~~Scanning Risk to take advantage of the correlations between the different constituents of the Combined Commodity. Another example is the specific case of short deeply out-~~

[13] Unsettled Items resulting of a physical delivery of Government of Canada Bond Futures are margined under the VaR methodology.

[14] The initial reference price is the market price or the theoretical price derived from market observations.

~~of-the-money options wherein the Risk Engine calculates a minimum amount called Short Option Minimum (SOM) which otherwise attracts little or no Base Initial Margin. Finally, in the case of OTCI with physical settlement/delivery, the Corporation calculates an additional Liquidity Interval and adds it to the Margin Interval.~~

~~It should also be noted that, as described in the following sections, the determination of the Base Initial Margin is slightly different for Options contracts, Futures contracts, Share Futures and Fixed Income Transactions. The following table summarizes the list of variables used to calculate the Base Initial Margin by cleared product category:~~

Input variables to calculate the Base Initial Margin	Options ~~contracts (including OTCI Options)~~	Futures ~~contracts and Share Futures~~	~~Fixed Income Transaction~~ ~~s~~Unsettled Items
Scanning Risk	•	•	•
Intra-Commodity ~~(Inter-Month) Spread Charge~~		•	~~•~~
Inter-Commodity ~~Spread Charge~~[15]		•	~~•~~
Short Option Minimum ~~(SOM) amount~~	•		
~~Liquidity Interval~~[16]	~~•~~		

Scanning Risk

~~As fundamental inputs to calculate the Base Initial Margin, the Corporation uses the following parameters: 1) confidence level (to reflect normal market conditions), 2) assumed liquidation period and 3) historical volatility over a specific period. The historical~~

[15] ~~–~~ Not applicable for Share Futures ~~contracts~~.

~~[16] Applicable for OTCI Options with physical settlement/delivery only.~~

~~volatility, combined with the liquidation period and the confidence level gives the Margin Interval (MI) as described below.~~

~~6.1.1 Margin Interval (MI) Calculation~~

~~The Margin Interval calculations are re-evaluated on a regular basis. However, the Corporation may use its discretion and update the Margin Intervals more frequently if necessary. The Margin Intervals are used to calculate the Base Initial Margin for each Derivative Instrument.~~

~~The Margin Interval (MI) is calculated using the following formula:~~

$$\cancel{MI = \alpha \times \sqrt{n} \times \sigma}$$

6.1.1 ~~**Where 'n' is the number of liquidation days (see the next section for more details). 'α' is equal to the critical value equivalent to 99.87% (three standard deviations) of the cumulative Normal distribution (applicable to all products except for the BAX Futures products) or equal to the critical value equivalent to 99% of the cumulative Student's t-distribution with 4 degrees of freedom (applicable to the BAX Futures products).**~~

The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The table at the end of this section shows all the risk scenarios. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others. If the largest loss is negative, the Scanning Risk is set to zero. The Scanning Risk is then compared to the Short Option Minimum. This amount is required if the Short Option Minimum is higher than the result of the Risk Arrays.

6.1.1.1 Price Scan Range

The term PSR represents the potential variation of the contract value and it is calculated through the following formula:

$$PSR = \ Price \ \times MI \ \times Contract\ Size$$

The methodology for the MI is detailed in Section 6.5..

6.1.1.2 Volatility Scan Range

The term VSR represents the potential variation of the implied volatility and it is calculated through the following formula:

$$VSR = \ Volatility\, Shock\ \times \sqrt{n}$$

Where 'n' is the MPOR, and 'Volatility Shock' represents the 95% confidence level of the historical daily fluctuations for the series volatility over a one year look-back period. The daily fluctuations are scaled up with the use of MPOR. VSR values are subject to a floor value and a cap value.

~~'σ' is the volatility estimator of the contract's returns and is computed using an exponentially weighted moving average (EWMA) approach.~~

~~The implemented formula for the estimator at any time *t* is:~~

$$\sigma_t = \sqrt{(1-\lambda)\sum_{i=1}^{260}\lambda^{i-1}(R_{t-i}-\overline{R})^2 \Big/ (1-\lambda^{260})}$$

~~Where R is the daily price returns of the Underlying Interests for Options contracts and Share Futures, the daily price returns of the Futures prices for Futures contracts (excluding Share Futures) and the yield-to-maturity (YTM) daily variation of the on-the-run security for Fixed Income Transactions , $\overline{R}$ is the mean return over the specified period and λ is the decay factor. CDCC uses λ = 0.99.~~

~~In addition, CDCC considers a minimal floor for the EWMA volatility estimator defined above. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. In other words, the volatility estimator that will be used to calculate the MI cannot be lower than the calculated floor.~~

~~6.1.2 Liquidation Period~~

~~The Corporation applies a different number of liquidation days "n" depending on the type of product. The Corporation uses quantitative and qualitative analysis, established according to the degree of liquidity of the product/Underlying Interest which is derived from parameters such as, but not limited to, traded volume, Government of Canada/provincial yield spreads and international guidelines. For all products, "n" is determined at least once a year and communicated to Clearing Members by a written notice.~~

~~Furthermore, in anticipation of Remembrance Day (the "Banking Holiday"), the Corporation will add one (1) more Business Day to the number of liquidation days "n" for Equity and Index products.~~

~~6.1.3 Price Scan Range (PSR) Calculation~~

~~In order to calculate the most unfavourable projected liquidation value, the Risk Engine uses the MI of the above formula to calculate the Price Scan Range (PSR)~~

~~and to run several scenarios through its Risk Array calculation (for a detailed description refer to Section 6.1.4.1 on Risk Arrays below).~~

~~A Risk Array is a set of 16 scenarios defined for a particular contract specifying how a hypothetical single position will lose or gain value if the corresponding risk scenario occurs from the current situation to the near future (usually next day).~~

~~PSR is the maximum price movement reasonably likely to occur, for each Derivative Instrument or, for Options contracts, their Underlying Interest. The term PSR is used by the Risk Engine to represent the potential variation of the product value and it is calculated through the following formula:~~

~~PSR = Price x MI x Contract Size.~~

~~6.1.4 Base Initial Margin for Options Contracts~~

~~This section describes how the Base Initial Margin is calculated for the Options contracts, which include the equity options, index options, currency options, exchange-traded-fund options and options on futures.~~

~~The Risk Arrays are obtained by varying the Underlying Interest (eight scenarios) and the option's implied volatility (eight scenarios). The term PSR for Options contracts is calculated through the following formula:~~

~~PSR = Underlying Interest Price x MI x Contract Size~~

~~For equity options contracts, the contract size is usually equal to 100.~~

~~6.1.4.1 Risk Arrays~~

~~Each Risk Array scenario represents losses or gains due to hypothetical market conditions:~~

- ~~The (underlying) price movement: upward (+) and downward (-) with corresponding scan range fraction (0, 1/3, 2/3, 3/3 or 2).~~
- ~~The (underlying) volatility movement: upward (+) and downward (-) with corresponding scan range fraction (0 or 1).~~

~~Since some scenarios consider large movements on the Underlying Interest price, the whole difference (gain and loss) between the new (simulated) theoretical option price and the actual option price will not be considered. For scenarios 15 and 16, since their probability of~~

~~occurrence is low, only a fraction of 35% of the difference is considered. The purpose of these two additional extreme scenarios is to reduce the problem of short option positions that are highly out of the money near expiration. If the Underlying Interest price varies sharply, these positions could then be in the money.~~

~~A scan range is a fluctuation range of the Underlying Interest price and volatility defined for each Combined Commodity.~~

~~The Risk Engine calculates 16 Risk Array scenarios as follows:~~

Risk Scenarios	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Underlying Price Variation *	0	0	1/3	1/3	-1/3	-1/3	2/3	2/3	-2/3	-2/3	1	1	-1	-1	2	-2
Volatility Variation *	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	0	0
Weight Fraction Considered	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	35%	35%

* Expressed in scan range

~~Each Risk Array value is calculated as the current contract price less the theoretical (simulated) contract price obtained for the corresponding scenario by using the valuation model. (The Risk Engine uses different valuation models including Black 76, Black-Scholes, Generic Merton, Barone-Adesi-Whaley (BAW) and others).~~

~~However, it should be noted that for all the intra-day Margin processes, CDCC relies on the previous Business Day's closing prices for those Option contracts for which it has an open interest.~~

~~However, since the Base Initial Margin driven by Option contracts is relatively small with respect to the total Base Initial Margin that includes all cleared products, the Corporation does not consider the Volatility Scan Range (VSR) in its risk model. This means that the Corporation does not vary the option implied volatility up and down (+1 and -1) eight times, but varies only the Underlying Interest price in order to simulate the potential losses for each position. Therefore, the Risk Engine produces eight different scenarios as shown in the table below.~~

~~Risk Scenarios~~	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~
~~Underlying Price Variation*~~	~~1/3~~	~~-1/3~~	~~2/3~~	~~-2/3~~	~~1~~	~~-1~~	~~2~~	~~-2~~
~~Weight Fraction Considered~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~35%~~	~~35%~~

~~* Expressed in scan range~~

~~For Options contracts belonging to the same Combined Commodity, the Risk Engine first calculates the Risk Arrays for each Option contract and for each one of the eight risk scenarios. The Risk Engine then adds up the Risk Arrays results of all Options contracts under the same risk scenario. For example, for two Options contracts O1 and O2 on the Underlying Interest XX, the same scenarios are performed for each Option contract, and then, they are added up. Therefore, the Risk Array value for O1 under the risk scenario 1 is added up to the Risk Array value for O2 under the risk scenario 1, likewise the Risk Array value for O1 under the risk scenario 2 is added up to the Risk Array value for O2 under the risk scenario 2, and so on. The largest total Risk Array value amongst the eight values is the Scanning Risk of this Combined Commodity.~~

~~For a better explanation of the Risk Engine methodology used by the Corporation, here are the steps to calculate the Base Initial Margin for an Option contract using the Risk Array:~~

~~Example 1:~~

~~Let's assume that the price of an Option contract is X0, its Underlying Interest price is P0 and its Margin Interval is MI. Using the formula~~

~~described above, we can calculate the Price Scan Range (PSR) of the option which represents the fluctuation range of the Underlying Interest as follows:~~

~~PSR = MI x P0 x Contract Size.~~

~~Since the contract size of an Option contract is generally 100, the formula becomes:~~

~~PSR = MI x P0 x 100~~

~~For the clarity of the table below, please note that the PSR used in the following steps does not include the contract size, i.e. PSR = MI x P0.~~

~~Step 1: calculate the Underlying Interest price variation. To accomplish this, the Risk Engine varies the Underlying Interest price by 33% (or 1/3) to the upper range of its MI. If for example the MI is 30%, the Underlying Interest price moves to the upper range by 33% of the 30% which leads to a 10% increase. Therefore, the Underlying Interest price variation is +33% of the PSR.~~

~~Step 2: calculate the new (simulated) Underlying Interest price by adding the Underlying Interest price variation calculated in the last step to the original Underlying Interest price.~~

~~Step 3: calculate the new (simulated) theoretical option price with the selected model using the new (simulated) Underlying Interest price.~~

~~Step 4: calculate the option's gain or loss by subtracting the new (simulated) theoretical option price from the original option price.~~

~~Step 5: multiply the gain or loss by the considered weight fraction (the last row of the above table) to get the Risk Array amount associated to the scenario 1.~~

~~After repeating the above steps for the remaining seven scenarios, the Risk Engine chooses the largest amount of (the weighted) gain or loss as the most unfavourable projected liquidation value (worst case) of the option. This amount is called the Scanning Risk.~~

~~Here is the same table as before but with the formulas of each step:~~

~~Risk Scenarios~~	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~
~~Underlying Price Variation~~	~~1/3 * PSR~~	~~-1/3 * PSR~~	~~2/3 * PSR~~	~~-2/3 * PSR~~	~~PSR~~	~~-1 * PSR~~	~~2 * PSR~~	~~-2 * PSR~~
~~New Underlying Price~~	~~P_1 = P_0 + 1/3 * PSR~~	~~P_2 = P_0 - 1/3 * PSR~~	~~P_3 = P_0 + 2/3 * PSR~~	~~P_4 = P_0 - 2/3 * PSR~~	~~P_5 = P_0 + PSR~~	~~P_6 = P_0 - PSR~~	~~P_7 = P_0 + 2 * PSR~~	~~P_8 = P_0 -2 * PSR~~
~~New Option Price~~	~~X_1~~	~~X_2~~	~~X_3~~	~~X_4~~	~~X_5~~	~~X_6~~	~~X_7~~	~~X_8~~
~~Gain / Loss~~	~~P&L$_1$ = X_0 - X_1~~	~~P&L$_2$ = X_0 - X_2~~	~~P&L$_3$ = X_0 - X_3~~	~~P&L$_4$ = X_0 - X_4~~	~~P&L$_5$ = X_0 - X_5~~	~~P&L$_6$ = X_0 - X_6~~	~~P&L$_7$ = X_0 - X_7~~	~~P&L$_8$ = X_0 - X_8~~
~~Weight Fraction Considered~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~35%~~	~~35%~~
~~Risk Arrays Results~~	~~RA$_1$ = 100%*P&L$_1$~~	~~RA$_2$ = 100%*P&L$_2$~~	~~RA$_3$ = 100%*P&L$_3$~~	~~RA$_4$ = 100%*P&L$_4$~~	~~RA$_5$ = 100%*P&L$_5$~~	~~RA$_6$ = 100%*P&L$_6$~~	~~RA$_7$ = 35%*P&L$_7$~~	~~RA$_8$ = 35%*P&L$_8$~~

~~The table above shows all details about the Risk Engine method used by the Corporation to calculate the worst potential loss of an Option contract. The last row has the eight Risk Arrays outcomes. The largest amount (positive amount) amongst the eight amounts is the Scanning Risk which will be, in most cases, the Base Initial Margin of this position.~~

~~It is important to note that the above calculations are performed at the Combined Commodity level, implying that when there is more than a single contract with the same Underlying Interest, the Risk Engine method calculates the Risk Arrays for all contracts belonging to the same Combined Commodity and then sums up the Risk Arrays results thus calculated for all contracts for the same scenario. In other words, the RA$_1$ of the first contract is added up to the RA$_1$ of the second contract and to the RA$_1$ of the nth contract that belong to the same Combined Commodity in order to get the Total RA$_1$ for the same Combined Commodity. Then, the RA$_2$ of the first contract is added up to the RA$_2$ of the second contract and to the RA$_2$ of the nth contract that belong to the same Combined Commodity in order to get the total RA$_2$ for the Combined Commodity. Likewise we obtain the total RA$_3$, RA$_4$, RA$_5$, RA$_6$, RA$_7$ and RA$_8$. Finally, the~~

~~Risk Engine considers the largest amount of the eight total Risk Arrays as the Scanning Risk.~~

~~Example 2:~~

~~Let's assume a portfolio with three different positions: a short position in ten (10) Futures contracts on the S&P/TSX 60 Index, a long position in six (6) call Options contracts on the same index and a short position in three (3) put Options contracts on the same Underlying Interest (the expiry date for these three Options contracts might be the same or different).~~

~~In addition, the contract size and the price of the Futures contract are respectively 200 and F_0 and its Margin Interval is MI_F. The price of the call option is X_0, the price of the put option is Y_0 and the contract size of these two Option contracts is 100, whereas the price of the Underlying Interest S&P/TSX 60 Index is P_0 and its Margin Interval is MI_I. The MI_F and the MI_I values are almost the same but not exactly equal since the first is calculated using the historical volatility of the Future's returns, whereas the second is calculated using the historical volatility of the index's returns. However, since the index and the Futures contracts are strongly correlated, both Margin Interval values must be almost similar. Using the calculated Margin Intervals, we can calculate the Price Scan Range (PSR_F) of the Futures contract, which represents the fluctuation range of the Futures contract and the index Price Scan Range (PSR_I) which represents the fluctuation range of the underlying index as follows:~~

~~$PSR_F = MI_F \times F_0 \times \textit{Contract Size}$~~

~~and,~~

~~$PSR_I = MI_I \times P_0 \times \textit{Contract Size}$~~

~~Thus, since this Futures contract size is 200 and the contract size of the index option is 100, the previous formulas become:~~

~~$PSR_F = MI_F \times F_0 \times 200$~~

~~and,~~

~~$PSR_I = MI_I \times P_0 \times 100$~~

~~For the clarity of the table below, please note that the PSR_F and the PSR_I do not include the contract size, i.e. $PSR_F = MI_F \times F_0$ and $PSR_I = MI_I \times P_0$.~~

~~This is the Risk Arrays table of this example:~~

~~Risk Scenario~~	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~
~~10 Index Futures contracts~~								
~~Futures Price Variation~~	~~10 x 200 x 1/3 x PSR_F~~	~~-10 x 200 x 1/3 x PSR_F~~	~~10 x 200 x 2/3 x PSR_F~~	~~-10 x 200 x 2/3 x PSR_F~~	~~10 x 200 x PSR_F~~	~~-10 x 200 x PSR_F~~	~~10 x 200 x 2 x PSR_F~~	~~-10 x 200 x 2 x PSR_F~~
~~Weight Fraction Considered~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~35%~~	~~35%~~
~~Total Weighted Profit and Loss~~	~~$P\&L_{F1}$ = 2000 / 3 x PSR_F~~	~~$P\&L_{F2}$ = -2000 / 3 x PSR_F~~	~~$P\&L_{F3}$ = 4000 / 3 x PSR_F~~	~~$P\&L_{F4}$ = -4000 / 3 x PSR_F~~	~~$P\&L_{F5}$ = 2000 x PSR_F~~	~~$P\&L_{F6}$ = -2000 x PSR_F~~	~~$P\&L_{F7}$ = 1400 x PSR_F~~	~~$P\&L_{F8}$ = -1400 x PSR_F~~
~~6 Index Call Option Contracts~~								
~~Index Price Variation~~	~~1/3 x PSR_I~~	~~-1/3 x PSR_I~~	~~2/3 x PSR_I~~	~~-2/3 x PSR_I~~	~~PSR_I~~	~~-PSR_I~~	~~2 x PSR_I~~	~~-2 x PSR_I~~
~~New Index Price~~	~~$P_1 = P_0 + 1/3 * PSR_I$~~	~~$P_2 = P_0 - 1/3 * PSR_I$~~	~~$P_3 = P_0 + 2/3 * PSR_I$~~	~~$P_4 = P_0 - 2/3 * PSR_I$~~	~~$P_5 = P_0 + PSR_I$~~	~~$P_6 = P_0 - PSR_I$~~	~~$P_7 = P_0 + 2 * PSR_I$~~	~~$P_8 = P_0 - 2 * PSR_I$~~
~~New Call Option Price~~	~~X_1~~	~~X_2~~	~~X_3~~	~~X_4~~	~~X_5~~	~~X_6~~	~~X_7~~	~~X_8~~
~~Weight Fraction Considered~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~35%~~	~~35%~~
~~Total (6 x 100) Weighted Profit and Loss~~	~~$P\&L_{X1}$ = 600 x ($X_0 - X_1$)~~	~~$P\&L_{X2}$ = 600 x ($X_0 - X_2$)~~	~~$P\&L_{X3}$ = 600 x ($X_0 - X_3$)~~	~~$P\&L_{X4}$ = 600 x ($X_0 - X_4$)~~	~~$P\&L_{X5}$ = 600 x ($X_0 - X_5$)~~	~~$P\&L_{X6}$ = 600 x ($X_0 - X_6$)~~	~~$P\&L_{X7}$ = 210 x ($X_0 - X_7$)~~	~~$P\&L_{X8}$ = 210 x ($X_0 - X_8$)~~
~~3 Index Put Option Contracts~~								
~~New put Option Price~~	~~Y_1~~	~~Y_2~~	~~Y_3~~	~~Y_4~~	~~Y_5~~	~~Y_6~~	~~Y_7~~	~~Y_8~~
~~Weight Fraction Considered~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~100%~~	~~35%~~	~~35%~~

~~Total (-3 x 100) Weighted Profit and Loss~~	~~$P\&L_{Y1}$= -300 x (Y_0 - Y_1)~~	~~$P\&L_{Y2}$= -300 x (Y_0 - Y_2)~~	~~$P\&L_{Y3}$= -300 x (Y_0 - Y_3)~~	~~$P\&L_{Y4}$= -300 x (Y_0 - Y_4)~~	~~$P\&L_{Y5}$ = -300 x (Y_0 - Y_5)~~	~~$P\&L_{Y6}$= -300 x (Y_0 - Y_6)~~	~~$P\&L_{Y7}$ = -105 x (Y_0 - Y_7)~~	~~$P\&L_{Y8}$= -105 x (Y_0 - Y_8)~~
~~Combined Commodity Risk Arrays Results~~	~~RA_1 = $P\&L_{F1}$ + $P\&L_{X1}$ + $P\&L_{Y1}$~~	~~RA_2 = $P\&L_{F2}$ + $P\&L_{X2}$ + $P\&L_{Y2}$~~	~~RA_3 = $P\&L_{F3}$ + $P\&L_{X3}$ + $P\&L_{Y3}$~~	~~RA_4 = $P\&L_{F4}$ + $P\&L_{X4}$ + $P\&L_{Y4}$~~	~~RA_5 = $P\&L_{F5}$ + $P\&L_{X5}$ + $P\&L_{Y5}$~~	~~RA_6 = $P\&L_{F6}$ + $P\&L_{X6}$ + $P\&L_{Y6}$~~	~~RA_7 = $P\&L_{F7}$ + $P\&L_{X7}$ + $P\&L_{Y7}$~~	~~RA_8 = $P\&L_{F8}$ + $P\&L_{X8}$ + $P\&L_{Y8}$~~

~~The largest amount (positive number) of the eight Risk Arrays results is the Scanning Risk which will be the Base Initial Margin of a portfolio with these three positions.~~

~~By convention, Risk Array values are given for a single long position. For a short position, the calculated profit and loss is multiplied by the negative sign (-1). Losses for long positions are expressed as positive numbers and gains as negative numbers.~~

~~In the case of all the eight Risk Arrays values being negative (i.e. all corresponding to a gain) or zero (no risk), the Scanning Risk amount is set to zero.~~

~~The number of the Risk Arrays scenario that gives the largest amount (worst case scenario) for the option is called the Active Scenario. If two scenarios have the same figure, the one with the lowest scenario number is the Active Scenario. For example, if scenarios 5 and 7 give the largest and similar results, scenario 5 will be defined as the Active Scenario.~~

~~The Risk Engine calculates the Base Initial Margin for each Combined Commodity, for each member's account and sub-account. Thus, the Base Initial Margins calculated for each Combined Commodity account and sub-account are then sent to CDCS in order to be aggregated at the Clearing Member level.~~

~~Risk Arrays values are denominated in the same currency as the specific contract.~~

~~The Corporation's Risk Arrays file is published every Business Day on CDCC's website.~~

~~6.1.4.2 Short Option Minimum~~

~~In the event of a significant variation of the Underlying Interest price, short option positions can lead to significant losses. Therefore, the Risk Engine calculates a minimum amount called Short Option Minimum (SOM) for short positions in each Combined Commodity. This amount will be called if it is higher than the result of the Risk Arrays.~~

~~In order to determine the appropriate SOM for every group of products, CDCC considers Out of The Money (OTM) call and put Options for every Underlying Interest.~~

~~After shocking the Underlying Interest price by its appropriate stress scenario, as set forth in the relevant notice to members, CDCC re-calculates the price of all OTM call and put Options using the new Underlying Interest price and the same other parameters of the Options. The difference between the actual Option price and the new Option price represents the potential loss of the Option. Then, the average of all Options' losses is calculated to determine the potential loss for every Underlying Interest. Finally, the average of the potential losses for all Underlying Interests of the same group of products is calculated to determine the potential loss of the Combined Commodity, which represents its SOM. The latter is then translated in a percentage of the Price Scan Range (PSR).~~

~~This SOM calculation is reviewed on a regular basis, at least annually, and communicated to Clearing Members by written notice.~~

~~6.1.4.3 OTCI Options~~

~~The Base Initial Margin calculation process for OTCI Options is the same as for listed options, except that the Corporation uses a theoretical price calculated using an in-house program, instead of the contractual option price.~~

~~Theoretical Price Calculation~~

~~In order to evaluate the Option price, we need to determine the implied volatility to be used. For this, two different methodologies are used depending on whether the Option is an Exchange traded Option.~~

~~If the Option contract is an Exchange traded Option, the Corporation uses the Option's data (the entire Option series for one expiry month) available at the Exchange and builds a Smile Volatility Curve using a Cubic Spline function. After building the Smile Curve, the Corporation determines the implied volatility that corresponds exactly to the strike price of the Option to be assessed. If the expiry date of the Option does not correspond to the ones of the listed series, the Corporation builds two Smile Volatility Curves, one using the Option series with an expiry date that is right after the one of the assessed Option and one using the series of Options with an expiry date that is right before the one of the assessed Option.~~

~~Then, the volatility that corresponds to the strike price of the Option to be assessed is determined on each curve. Finally, a linear interpolation is done to determine the volatility that corresponds to the strike and to the expiry date of the Option to be assessed. However, if the expiry date of the Option to be assessed is before (after) the first (last) expiry date of the listed Options series, the Corporation uses the volatilities of the Smile Volatility Curve of the first (last) expiry date of the listed Option series.~~

~~If the Option is not listed and no data is available for it, the Corporation uses the yearly historical volatility of the Option's Underlying Interest price as a proxy for the implied volatility.~~

~~Liquidity Interval~~

~~To calculate the Margin Interval for OTCI Options, the Corporation may apply a different number of liquidation days. In addition, for OTCI with physical settlement/delivery, the Corporation calculates an additional Liquidity Interval and adds it to the Margin Interval.~~

~~The assumptions under which the Liquidity Interval is calculated are similar to the assumptions the Corporation uses to calculate the Margin Interval, i.e., the confidence interval over 99% is obtained by using 3 standard deviations (based on the normal distribution's assumptions). The Liquidity Interval is calculated based on the historical bid-ask price~~

~~spread of the Underlying Interest according to the same formula for Margin Interval.~~

~~6.1.5 Base Initial Margin for Futures Contracts~~

~~This section describes how the Base Initial Margin is calculated for Futures contracts, which includes Index Futures, Interest Rate Futures, Government of Canada Bonds Futures and Share Futures.~~

~~The first part of example # 2 in Section 6.1.4.1 shows how the Scanning Risk is calculated. The Scanning Risk represents the most unfavourable projected liquidation value of the Futures position. The calculated Scanning Risk is the Base Initial Margin for a Futures contract. However, since the Futures contract prices are linear with respect to their Underlying Interest prices, the Active Scenario for a Futures contract is always the one with the positive amount between scenario 5 and scenario 6. In other words, the Base Initial Margin for a Futures contract is always equal to its Price Scan Range (PSR).~~

~~With respect to the Three-Month Canadian Bankers' Acceptance Futures (BAX) contract, CDCC combines the contracts in different groups and applies the same charge to the contracts of a same group.~~

The MI, MPOR and Volatility Shocks values are updated by CDCC from time to time.

~~6.1.5.1~~6.1.2 Intra-Commodity ~~(Inter-Month) Spread Charge~~

~~The different Futures contracts belonging to the same Combined Commodity have in general positive correlated returns. For example, a portfolio composed of a long position and a short position of two Futures contracts that have the same Underlying Interest but different expiry dates, will be less risky than the sum of the two positions taken individually. Margins on correlated positions address this fact.~~

~~The Risk Engine automatically matches the long~~Long positions on Futures maturing in one month are automatically matched with ~~the~~ short positions on Futures maturing in another month. The resulting Base Initial Margin ~~Requirement~~ on these two Futures ~~contracts~~ belonging to the same Combined Commodity, could be lower than the real risk associated with the combination of the two contracts. ~~To address this issue, the Risk Engine allows the user to calculate and apply an~~

~~additional charge relative to the inter-month spread risk, in order to cover the risk associated with these two positions. This Margin is called Inter-Month Spread Charge or Intra-Commodity (Inter-Month) Spread Charge (because it is calculated within the same Combined Commodity).~~In order to cover this inter-month spread risk, a charge is included in the Base Initial Margin.

For the Futures, the Intra-Commodity ~~(Inter-Month) Spread Charge on correlated Futures positions is calculated by the Corporation's risk department and updated on a regular basis.~~

~~For the Futures contracts, the Intra-Commodity (Inter-Month) Spread Charge (ICSC)~~ which is an additional dollar amount charge applied to each combination of two different Futures ~~contracts~~, is determined as follows:

$$\cancel{ICSC = \alpha \times \sqrt{n} \times \sigma}$$

$$Intra - Commodity = \alpha \times \sqrt{n} \times \sigma$$

Where 'n' is the number of ~~liquidation days (see the Margin Interval (MI) Calculation section for more details). 'α'~~MPOR, $'\alpha'$ is equal to the ~~critical~~confidence value equivalent to 99.87% (three standard deviations) of the cumulative ~~Normal~~normal distribution (applicable to all products except for the Three-Month Canadian Bankers' Acceptance Futures (BAX ~~Futures products)~~)) or equal to the ~~critical~~confidence value equivalent to 99% of the cumulative ~~Student's~~student's t-distribution with 4 degrees of freedom (applicable to the BAX Futures ~~products~~). 'σ' is the volatility estimator of the Futures combination's daily profit and loss ~~(P&L)~~ over the reference period and is computed using the EWMA approach. ~~The~~ Further details on the EWMA ~~formula is~~are described in ~~the Margin Interval (MI) Calculation section~~Appendix 6.5.

In addition, CDCC considers a ~~minimal~~ floor for the EWMA volatility estimator. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. ~~In other words, the~~The EWMA volatility estimator that will be used to calculate the ~~ICSC~~Intra-Commodity cannot be lower than the calculated floor.

With respect to the ~~Three-Month Canadian Bankers' Acceptance Futures (~~BAX~~) contract~~, CDCC calculates the Intra-Commodity ~~(Inter-Month) Spread Charge~~ for all combinations of spreads and butterfly-strategies and applies a same charge for a same group of combinations with close maturities. If multiple Intra-Commodity are defined, the Corporation will prioritize the ones providing the lowest Base Initial Margin.

~~For all Futures contracts, in order to consider the highest economical correlation between the different Futures contracts and to offer the highest benefit to the Clearing Members, CDCC applies the different Intra-Commodity (Inter-Month) Spread Charges by considering the combinations with the lowest charges first and the ones with the highest charges will be considered at the end. If two different combinations or group of combinations will have the same charge, the one with the lowest maturity will be considered first. This is the same spread priority concept that is applied for Fixed- Income Transactions.~~

~~The Intra-Commodity (Inter-Month) Spread Charges and the spread priorities are updated and published on the CDCC website on a regular basis.~~

~~**6.1.5.2 Inter-Commodity Spread Charge**~~

~~Similarly, the~~The combinations and the spread priorities for the Intra-Commodity are updated by CDCC from time to time.

6.1.3 Inter-Commodity

The Corporation ~~considers~~may consider the correlation that exists between different ~~classes of~~ Futures ~~contracts~~ when calculating the Base Initial Margin. ~~For example, different interest rate Futures contracts are likely to react to the same market indicators, but at different degrees. For instance, a portfolio composed of a long position and a short position on two different interest rate Futures contracts will be likely less risky than the sum of the two positions taken individually.~~ The Corporation will grant a ~~Margin relief~~credit according to the historical correlation of the returns of the two Futures ~~contracts.~~

~~When calculating the Base Initial Margin on a portfolio with several long and short Futures positions~~. If multiple Inter-Commodity are defined, the Corporation ~~matches the positions in accordance with predefined steps. For example, if the~~

~~first matching step consists of matching long or short positions on the front month Futures contracts with long or short positions on the second front month Futures contract, the positions of both Futures contracts might not be equal. In this case, the Corporation determines, using the hedge ratio concept the exact position (number of contracts) of a Futures contract that can be offset by a position on the other Futures contract. Any position that has not been matched will be available for the second matching step. This is the same spread priority process also defined for Cash Buy or Sell Trades and Repurchase Transactions~~will prioritize the ones with the highest correlation.

~~The Corporation regularly performs an analysis to determine the Margin reductions that are applied for all Futures contracts combinations.~~

~~The Corporation may also consider the positive (negative) correlation that exists between the different interest rate Futures contracts and the~~ The Inter-Commodity and the spread priorities are updated by CDCC from time to time.

6.2 BASE INITIAL MARGIN CALCULATION FOR FIXED INCOME TRANSACTIONS

For greater certainty, this section only applies to Fixed Income Transactions~~, and provides~~ .

To calculate the Base Initial Margin, the VaR methodology is based on Historical Scenarios for all relevant Risk Factors. The Historical Scenarios consist of a ~~Margin benefit~~set of scenarios for a ~~combination of any Futures contracts with~~ Risk Factor over a relevant historical period that represents an hypothetical market observation movement (shocked market observation based on market history) reasonably likely to occur, from the current situation to a specific point in time in the ~~opposite (same)~~future.

For Fixed Income Transactions~~.~~, the Risk Factors are the Zero Curves. On any given Business Day, the shocks derived from the Historical Scenarios are applied to the initial reference market inputs values. The difference between the initial reference price and the shocked historical price represents an Historical P&L Scenario. The initial reference price and historical shocked price are derived respectively from the initial reference Zero Curves and the shocked Zeros Curve using a full revaluation method.

~~6.1.5.3 Spread Priority~~

~~To determine the appropriate Margin reduction for each combination of two Futures contracts, the Corporation performs the following steps:~~

~~Use the yearly historical data of the different Futures contracts and calculate the correlation matrix.~~

~~For the priority allowance, start by considering the closest diagonal to the leading one (the diagonal with the 100% correlations that represent the Futures contracts correlations with themselves). This closest diagonal usually contains the highest correlations because of the proximity of the maturities. Then, consider the second closest diagonal, then the third and so on until the last diagonal that has one correlation number.~~

~~Amongst the numbers of each diagonal, consider the highest number first, then the second highest number, then the third and so on until the last number. This methodology's goal is to maximise the Margin reduction applied to the Clearing Members. Discounts~~The Historical P&L Scenarios are ~~applied to all the matrix correlation numbers before the priority process. The discounts are meant to cover the potential daily variation of the correlations.~~

~~If there is one or some ties between the discounted numbers within the same diagonal, consider the one with the lowest maturity first, then the second, then the third and so on until the last one.~~

~~Different Futures contracts that do not have the same contract size nor the same volatility yield would not have a Margin reduction applied to their respective entire positions. By consequent, a hedge ratio is used to determine how much position of one contract in any combination can be matched with the other Futures contract of the same combination. The remaining position (or quantity of Futures contracts) of any contract of this first combination will be matched with another position to form another combination according to the above priority process. At the end of this process, there might be a single outright position that is left to be margined individually.~~

~~The Corporation allows a Margin reduction for two positively correlated Futures contracts with different directions and for two negatively correlated Futures contracts with same directions.~~

~~When the spread priority process is performed, the Corporation considers the combinations between interest rate Futures contracts first (Intra-Commodity (Inter-Month) Spread Charge). Any remaining (outright) positions in these Futures contracts positions will be considered for Inter-Commodity Spread Charge with~~ calculated at the VaR Risk Group level and are denominated in the same currency as the Fixed Income Transactions.

~~6.1.6 Base Initial Margin for~~ For Fixed Income Transactions

~~A Fixed Income Transaction is defined as either a Repurchase Transaction or a Cash Buy or Sell Trade. A Cash Buy or Sell Trade is the sale of a security from one party to another. Depending on its maturity, the Fixed Income Security can be delivered one or two Business Days after the Fixed Income Transaction is completed. Between the Fixed Income Transaction novation date and the delivery date, the Corporation has to cover the counterparty risk.~~

~~In such Repurchase Transaction, there are two sources of risk that the Corporation needs to consider and cover, namely, the security price risk described in Section 6.1.6.1 below and the interest rate risk described in Section 6.1.6.2 below. However, in a Cash Buy or Sell Trade, there is only one source of risk that the Corporation needs to consider and cover, namely, the security price risk described in Section 6.1.6.1 below.~~

~~6.1.6.1 Security Price Risk~~

~~The methodology to calculate the Base Initial Margin~~ belonging to the same VaR Risk Group, the Historical P&L Scenarios results are added up for Fixed Income Transactions ~~is slightly different from the Options contracts and Futures contracts. Indeed, the different types of securities that are accepted by the Corporation for clearing of a Fixed Income Transaction are separated in different Buckets depending on their remaining time to maturities and issuers. In addition, in its risk model, the Corporation assumes that all securities belonging to the same Bucket have the same yield volatility expressed in terms of Margin Interval (same concept of Margin Interval described before) which is calculated~~

~~using the Yield-To-Maturity (YTM) of the on-the-run security of the Bucket. The Margin Interval is calculated as follows:~~.

$$\cancel{MI = \alpha \times \sqrt{n} \times \sigma}$$

~~Where 'n' is the number of liquidation days (see the Margin Interval (MI) Calculation section for more details). 'α' is equal to the critical value equivalent to 99.87% (three standard deviations) of the cumulative Normal distribution. 'σ' is the volatility estimator of the YTM's daily variation of the on-the-run security over the reference period and is computed using the EWMA approach. The EWMA formula is described in the Margin Interval (MI) Calculation section.~~

~~In addition, CDCC considers a minimal floor for the EWMA volatility estimator. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. In other words, the volatility estimator that will be used to calculate the MI cannot be lower than the calculated floor.~~

~~It's important to note that for some particular Buckets, there may not be any on-the-run security. In this particular situation, a linear interpolation between the MIs of the two closest Buckets is performed to determine the MI of the particular bucket.~~

~~Each Bucket is considered as a Combined Commodity.~~

Lastly, the Historical P&L Scenarios are ranked to derive the Historical P&L Distribution that is used to calculate the average loss of the portfolio using the Expected Shortfall method. A Margin Buffer Multiplier is then applied to the Expected Shortfall value to obtain the Base Initial Margin.

The main steps to calculate the Base Initial Margin are described in the section below.

6.2.1 Historical Filtered Scenarios

The Historical Filtered Scenarios are generated using the initial reference Risk Factors value and historical observations of different tenors on the Zero Curves.

The shocked Risk Factors are calculated using the following formula:

$$y'_{t,\tau} = y_{T,\tau}(1 + R_{t,\tau}c_{t,\tau})$$

Where c is the scaling factor for the volatility scaling adjustment and R is the daily relative market return over the Margin Period of Risk 'n'. CDCC uses a look-back period of 5 years.

The scaling factor formula at time t and for a given tenors is calculated using the following formula:

$$c_{t,\tau} = Max\left(\frac{\sigma_{T,\tau} + \sigma_{t,\tau}}{2\,\sigma_{t,\tau}}, Min\ SF\right)$$

Where σ is the EWMA volatility forecast and Min SF is the minimal scaling factor.

The implemented formula for the EWMA volatility forecast is:

$$\sigma_{t,\tau}^2 = (1-\lambda)R_{t-1,\tau}^2 + \lambda\sigma_{t-1,\tau}^2,$$

Where R is the relative market return over the Margin Period of Risk 'n' and λ is the decay factor. CDCC uses λ = 0.99. The Min SF is updated by CDCC from time to time.

6.2.2 Historical P&L Scenario generation

The Historical P&L Scenarios are valued by calculating the difference between the shocked prices of Fixed Income Transactions under an Historical Filtered Scenario and the initial reference prices. The Historical P&L Scenarios results are added up for all Fixed Income Transactions within a VaR Risk Group.

The initial reference prices are calculated using a full revaluation method and the initial reference Risk Factors. The shocked prices are calculated using a full revaluation method and the shocked Risk Factors.

6.2.3 Expected Shortfall

For each VaR Risk Group, the Historical P&L is sorted from largest loss to largest profit to construct the Historical P&L Distribution. Using a confidence value equivalent to 99.64% and the Historical P&L Distribution, the Expected Shortfall is determined by averaging the losses exceeding the confidence value.

6.2.4 Margin Buffer Multiplier

The Base Initial Margin ~~amount related to the security's price of a Fixed Income Transaction on one security belonging to a Bucket is calculated as follows:~~

~~Base Initial Margin 1 = Security's Price x MI x D x Contract Size~~

~~Where D is the duration of the security and the contract size is the transaction's nominal value divided by 100. However, for all securities that belong to the 3-month, 6-month and 1-year buckets, CDCC uses a fixed duration which is set at 1.~~

~~Thus, all related Fixed Income Securities belonging to the same Bucket have the same Margin Interval but each specific Repurchase Transaction related security of the same Bucket has a different Base Initial Margin driven~~for each VaR Risk Group is obtained by ~~its own price and its own duration~~applying a Margin Buffer Multiplier to the Expected Shortfall value.

~~**6.1.6.2 Interest Rate Risk (Repurchase Transactions)**~~

~~The Floating Price Rate changes continuously during the life of a Repurchase Transaction. On one hand, if the Floating Price Rate decreases and the Repo Party defaults, the Corporation, as a central counterparty, incurs market risk. The position may be transferred to any Fixed Income Clearing Member who agrees to buy the Fixed Income Security at the expiry date with the new market conditions. In this case, the Corporation has to cover the potential decrease in the Floating Price Rate (negative variation for the seller) that could arise during the next specific period. On the other hand, if the Floating Price Rate increases and the Reverse Repo Party defaults, the Corporation, as a central counterparty, incurs market risk. The position may be transferred to any Fixed Income Clearing Member who agrees to sell the same Fixed Income Security at the expiry date with the new market conditions. In that case, the Corporation has to cover the potential increase in the Floating Price Rate (negative variation for the buyer) that could arise during the next specific period.~~

~~In order to properly quantify the risk related to the Floating Price Rate using the Risk Engine, it is necessary to model the Floating Price Rate into~~

~~a Virtual Futures Contract (VFC) with a price equal to: VFC's price = 100 - Floating Price Rate. For an overnight Repurchase Transaction the Base Initial Margin is straightforwardly calculated by sending to the Risk Engine the determined VFC. However, in order to calculate the VFC's price for longer term Repurchase Transactions, the Corporation determines the appropriate interest rate using the overnight index swap (OIS) term structure.~~

~~The portion of the Base Initial Margin requirement that covers the Floating Price Rate related risk is then added to the portion of Base Initial Margin requirement that covers the security price related risk to get the total Base Initial Margin requirement for a Repurchase Transaction.~~

~~It's important to note that the portion of Base Initial Margin requirement that covers the Floating Price Rate related risk is very small with respect to the portion of Base Initial Margin requirement that covers the security price related risk.~~

~~6.1.6.3 Intra-Commodity (Inter-Month) Spread Charge~~

~~For Fixed Income Transactions, a portfolio composed of a short position and a long position on two different Acceptable Securities belonging to the same Bucket, will generate a lower Margin Requirement than if they were margined independently without considering their correlation.~~

~~The Risk Engine automatically matches the Seller and the Buyer of two different securities belonging to the same Bucket. The resulted Margin Requirement on these two Repurchase Transactions assumes a perfect correlation between the two Fixed Income Securities, thus the gain of one Fixed Income Security is offset by the loss of the other Fixed Income Security. However, the Acceptable Securities' prices are not perfectly correlated. Gains on one position should not totally offset losses of the other Fixed Income Security. To address this discrepancy, the Risk Engine allows to calculate and to apply a Margin charge relative to the inter-month spread risk in order to cover the risk of these two Fixed Income Transactions. This Margin is called the Intra-Commodity (Inter-Month) Spread Charge or Intra-Commodity (Inter-Month) Spread Charge (because it is calculated within the Combined Commodity).~~

~~The Intra-Commodity (Inter-Month) Spread Charge on correlated Acceptable Securities of each Bucket is calculated by the Corporation's risk department and updated regularly.~~

~~For Fixed Income Transactions, the Intra-Commodity (Inter-Month) Spread Charge (ICSC) which is an additional dollar amount charge applied to each combination of two different transactions on two different securities that belong to a same Bucket, is determined as follows:~~

$$\cancel{ICSC = \alpha \times \sqrt{n} \times \sigma}$$

~~Where 'n' is the number of liquidation days (see the Margin Interval (MI) Calculation section for more details). 'α' is equal to the critical value equivalent to 99.87% (three standard deviations) of the cumulative Normal distribution. 'σ' is the volatility estimator of the Fixed Income Transaction combination's daily profit and loss (P&L) over the reference period and is computed using the EWMA approach. The EWMA formula is described in the Margin Interval (MI) Calculation section.~~

~~In addition, CDCC considers a minimal floor for the EWMA volatility estimator. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. In other words, the volatility estimator that will be used to calculate the ICSC cannot be lower than the calculated floor.~~

~~6.1.6.4 Inter-Commodity Spread Charge~~

~~The Fixed Income Securities belonging to two different Buckets generally have a significant correlation. Inter-Commodity spread charge is a Margin amount generated for opposite or similar Fixed Income Transactions in two different Acceptable Securities belonging to two different Buckets.~~

~~Without any Margin relief, the Base Initial Margin for opposite or similar positions on two different Acceptable Securities belonging to different Buckets would be the sum of both Base Initial Margins. However, two different Fixed Income Transactions in different Acceptable Securities belonging to two different Buckets can benefit from a reduction in their Base Initial Margin requirements because of the consideration given to their correlation. The formula to get the portfolio's Base Initial Margin is:~~

~~Total Base Initial Margin = (Base Initial Margin Position 1 x Hedge Ratio Position 1 + Base Initial Margin Position 2 x Hedge Ratio Position 2) x (1 - Margin Relief)~~

~~The Margin relief is a percentage determined using the correlation matrix between the different on-the-run Fixed Income Securities of each Bucket.~~

~~The Inter-Commodity Margin relief percentages between the different Buckets are calculated by the Corporation's risk department and updated on a regular basis.~~

~~The Corporation also considers the positive (negative) correlation that exists between the different Fixed Income Transactions and the interest rate Futures contracts. The Corporation provides a Margin reduction for a combination of any Fixed Income Transactions with opposite or similar Futures contracts positions.~~

~~6.1.6.5 Spread Priority~~

~~To determine the appropriate Margin reduction for each combination of two Fixed Income Securities, the Corporation performs the following steps:~~

~~Use the yearly historical data of the different Fixed Income Securities and calculate the correlation matrix.~~

~~For the priority allowance, start by considering the closest diagonal to the leading one (the diagonal with the 100% correlations that represents the Fixed Income Securities correlations with themselves). The first diagonal usually contains the highest correlations because of the nearness of the maturities. Then, consider the second closest diagonal, then the third, and so on, until the last diagonal that has only one correlation number.~~

~~Amongst the numbers of each diagonal, consider the highest number first, then the second highest number, then the third and so on until the last number. This methodology's goal is to maximise the Margin reduction applied to the Clearing Members. Discounts are applied to all the matrix correlation numbers before the priority process. The discounts are meant to cover the potential daily variation of the correlations.~~

~~If there is one or some ties between the discounted numbers within the same diagonal, consider the one with the lowest maturity first, then the second, then the third and so on until the last one.~~

~~Different Fixed Income Securities that do not have the same price nor the same duration would not have a Margin reduction applied to their respective entire positions. By consequent, a hedge ratio is used to determine how much position of one contract in any combination can be matched with the other Fixed Income Transaction of the same combination. The remaining position (or quantity of Fixed Income Transaction) of any contract of this first combination will be matched with another position to form another combination, according to the above priority process. At the end of this process, there might be a single outright position that is left to be margined individually.~~

~~The Corporation allows a Margin reduction for two positively correlated Fixed Income Transactions with different directions and for two negatively correlated Fixed Income Transactions with same directions.~~

~~When the spread priority process is performed, the Corporation considers the combinations between Fixed Income Transactions first. Any remaining (outright) positions in these Fixed Income Transactions positions will be considered for Inter-Commodity spread charge with the Futures contracts.~~

~~6.1.6.6 Spread Priority Example~~

~~Here is an example of the matrix correlation demonstrating the application of the spread priority process:~~

~~Correlation~~	~~3 months~~	~~6 months~~	~~1 year~~	~~2 years~~	~~3 years~~	~~5 years~~	~~7 years~~	~~10 years~~	~~15 years~~	~~20 years~~	~~30 years~~
~~3 months~~	~~100%~~	~~92%~~	~~88%~~	~~68%~~	~~11%~~	~~-1%~~	~~2%~~	~~4%~~	~~24%~~	~~24%~~	~~14%~~
~~6 months~~		~~100%~~	~~94%~~	~~81%~~	~~54%~~	~~42%~~	~~5%~~	~~7%~~	~~26%~~	~~26%~~	~~17%~~
~~1 year~~			~~100%~~	~~82%~~	~~68%~~	~~46%~~	~~20%~~	~~22%~~	~~39%~~	~~39%~~	~~29%~~
~~2 years~~				~~100%~~	~~76%~~	~~59%~~	~~68%~~	~~69%~~	~~78%~~	~~75%~~	~~69%~~
~~3 years~~					~~100%~~	~~82%~~	~~87%~~	~~86%~~	~~93%~~	~~90%~~	~~89%~~
~~5 years~~						~~100%~~	~~91%~~	~~55%~~	~~57%~~	~~89%~~	~~88%~~
~~7 years~~							~~100%~~	~~80%~~	~~91%~~	~~70%~~	~~94%~~

~~10 years~~								~~100%~~	~~82%~~	~~95%~~	~~43%~~
~~15 years~~									~~100%~~	~~69%~~	~~97%~~
~~20 years~~										~~100%~~	~~67%~~
~~30 years~~											~~100%~~

~~The numbers in the first diagonal (blue) on the right of the 100% diagonal should be considered first, then the numbers in the second diagonal (green), then the numbers in the third diagonal (yellow), and so on, until the last white diagonal which contains one single number (the number of this cell is 14%).~~

~~Amongst the numbers in the first diagonal in blue, the combination with the highest number is treated first. In this case, it is a combination of 1-year Fixed Income Security with 6-month Fixed Income Security which has the highest number (94%). The combination with a 92% correlation is considered, followed by the combination with a 91% correlation, and so on.~~

~~Out of the 10 numbers of this diagonal, there are three correlations with the same percentage of 82%. By subsequent, the correlation with a 1-year Fixed Income Security and a 2-year Fixed Income Security has to be considered first, then the correlation with a 3-year Fixed Income Security and a 5-year Fixed Income Security has to be considered thereafter and finally the correlation with a 10-year Fixed Income Security and a 15-year Fixed Income Security has to be considered.~~

The Margin Buffer Multiplier is based on the ratio of the average 10 years volatility and the previous month volatility. CDCC will change the Margin Buffer Multiplier level if it is deemed stable for at least 3 consecutive months. The ratio is then rounded to the nearest 0.25. A floor of 1 and a cap value of 1.5 are applied.

The Margin Buffer Multiplier is updated by CDCC from time to time.

~~6.2~~6.3 RECALIBRATION OF THE EFFECTIVE RATIO

The Base Initial Margin requirement of each ~~LCM~~Limited Clearing Member is affected by a multiplication factor (the "Effective Ratio").

Objective: The Recalibration Methodology (as defined below) ensures that the Effective Ratio remains continuously consistent with the ratio of the total Clearing Fund Requirements on the total Base Initial Margin for all Clearing Members (excluding Limited Clearing Members) and addresses the permanence and persistence of a change.

Trigger: The Corporation shall review the Effective Ratio annually, and may review the Effective Ratio at any time following a change to the CDCC risk model which is required in order to comply on an ongoing basis with the regulatory requirements applicable to CDCC ("Risk Model Change"). Following such review, CDCC may recalibrate the Effective Ratio in accordance with the methodology set forth below (the "Recalibration Methodology"). For further clarity, a Risk Model Change captures both changes required by CDCC to comply on an ongoing basis with its current regulatory requirements and changes required to comply on an ongoing basis with applicable regulatory requirements.

~~6.2.1~~6.3.1 Recalibration Methodology

The Effective Ratio ("ER") shall be re-calibrated if the value of the ER, at the time of the calculation, is not within the range determined by the UB and LB (as defined below):

- Where the current ER is within one plus the Boundaries (defined below) applicable to a given period, no recalibration will be made to the Effective Ratio.
    - The **Boundaries** refer to the upper limit (UB) and lower limit (LB) which are respectively the highest and lowest Daily Ratios over a specific period.
    - The **Daily Ratio** is determined, for any Business Day, by dividing the total amount of Clearing Fund Requirements on that Business Day by the aggregate amount of the Base Initial Margin requirements of all Clearing Members (other than Limited Clearing Members) on the same Business Day.

- Where the current ER is outside one plus the Boundaries applicable to a given period, this will constitute a recalibration event (a “Recalibration Event”), and the ER shall be recalibrated in the following manner:
    - The Boundaries of Effective Ratio shall be rounded up or down to the nearest +/- 0.1 increment.
    - If ER > 1+ UB, the new Effective Ratio shall be equal to the UB.
    - If ER < 1+ LB, the new Effective Ratio shall be equal to the LB.
    - If ER ≤ 1+ UB and ER ≥ 1+ LB, there is no Recalibration Event.
- Annually, the Corporation shall determine the upper limit (UB) and lower limit (LB) parameters in accordance with the following:
    - At the time of the calculation, the UB and LB are determined by taking respectively the highest and lowest Daily Ratios over the prior calendar year, in accordance with the following formulas:

$$Lower\ Limit\ (LB) = \min\left({}^{Total\ CF_t}/_{Total\ Base\ IM_t}\right)$$

$$Upper\ Limit\ (UB) = \max\left({}^{Total\ CF_t}/_{Total\ Base\ IM_t}\right)$$

Where :

- $Total\ CF_t$: total amount of Clearing Fund Requirements on the Business Day t.
- $Total\ Base\ IM_t$: the aggregate amount of the Base Initial Margin requirements of all Clearing Members (other than Limited Clearing Members) on the Business Day ~~t~~.
- Min: lowest value from the set of Daily Ratios calculated for each Business Day t in the prior calendar year.
- Max: highest value from the set of Daily Ratios calculated for each Business Day t in the prior calendar year.

- Following a Risk Model Change, the Corporation shall determine the upper limit (UB) and lower limit (LB) parameters in accordance with the following:

- At the time of the calculation, the UB and LB are determined by taking respectively the highest and lowest Daily Ratios, by calculating the Daily Ratio over the prior 12 month-period with the use of simulated impacts to Base Initial Margin and Clearing Fund as they would have been observed had the Risk Model Change already been in place:

$$Lower\ Limit\ (LB) = min\left({}^{Total\ CF_t}/_{Total\ Base\ IM_t} \right)$$

$$Upper\ Limit\ (UB) = \max\left({}^{Total\ CF_t}/_{Total\ Base\ IM_t} \right)$$

Where :

- $Total\ CF_t$: total amount of Clearing Fund Requirements on the Business Day t.
- $Total\ Base\ IM_t$: the aggregate amount of the Base Initial Margin requirements of all Clearing Members (other than Limited Clearing Members) on the Business Day t.
- Min: lowest value from the set of Daily Ratios calculated for each Business Day t in the prior 12-month period.
- Max: highest value from the set of Daily Ratios calculated for each Business Day t in the prior 12-month period.
- For greater certainty, for the purposes of the calculating a Daily Ratio, the term "Base Initial Margin" excludes any Additional Margins.

~~6.2.2~~6.3.2 Recalibration Governance

- On a quarterly basis, CDCC will report to Risk Management Advisory Committee (RMAC) for information purposes the Boundaries calculated over the preceding quarter.
- On an annual basis, CDCC will report to RMAC the final Boundaries applicable over the preceding calendar year.
- Following a Risk Model Change CDCC will promptly report to RMAC on the impact of the Risk Model Change on the Boundaries, including whether it leads

to a Recalibration Event, and review the Risk Model Change in accordance with the RMAC standard governance process.

- Annually, or subsequent to any Risk Model Change, each ~~LCM~~Limited Clearing Member will be notified in writing of the new ER, where applicable.

~~6.2.3~~6.3.3 Entry in force

- Annually, or as soon as practicable upon the occurrence of a Recalibration Event subsequent to a Risk Model Change, the Corporation shall notify in writing each ~~LCM~~Limited Clearing Member of the new ER applicable to it.
- Subject to Section 6.2.4 below, new ERs shall become effective one calendar quarter after the date of the notification to each ~~LCM~~Limited Clearing Member of the new ER, and shall remain in force until a revised ER notified to the ~~LCM~~Limited Clearing Member either as a result of the ER annual review or subsequent to a Risk Model Change enters into force, in accordance with this section.

~~6.2.4~~6.3.4 Recalibration Additional Information

- If the Corporation notifies an ~~LCM~~Limited Clearing Member of the new ER applicable to it, the Corporation shall provide the ~~LCM~~Limited Clearing Member with the data supporting the determination that a Recalibration Event has occurred.
- Within 10 Business Days of receiving notice of the new ER applicable to it, an ~~LCM~~Limited Clearing Member may request additional information regarding the Recalibration.
- Upon receiving such request and in any event, within 5 Business Days following such request, the Corporation will provide additional information respecting the Recalibration Event.
- ~~An LCM~~A Limited Clearing Member may dispute a Recalibration Event by notifying the Corporation that it requires it to be discussed at the next following quarterly RMAC meeting.
- ~~If an LCM~~If a Limited Clearing Member has notified the Corporation and RMAC that it disputes a Recalibration Event and the Recalibration Event has been discussed at the subsequent quarterly RMAC meeting, unless a revision of the

ER has been agreed, the new ER shall become effective one calendar quarter after the date of the initial notification by the Corporation of the revised ER to the ~~LCM.~~ Limited Clearing Member.

6.4 OTCI SECURITIES OPTIONS

In order to evaluate the OTCI Option Price, the implied volatility of the contract must be derived. Two different methodologies are used depending on whether the Option is listed on an Exchange or not.

If the Option is exchange-traded, the Corporation uses the Option's data (the entire Option series for one expiry month) and builds a volatility curve using a cubic spline function. After building the volatility curve, the Corporation determines the implied volatility that corresponds exactly to the strike price of the Option to be assessed. If the expiry date of the Option does not correspond to the ones of the listed series, the Corporation builds two volatility curves, one using the Option series with an expiry date that is right after the one of the assessed Option and one using the series of Options with an expiry date that is right before the one of the assessed Option.

Then, the implied volatility that corresponds to the strike price of the Option to be assessed is determined on each curve. Finally, a linear interpolation is done to determine the implied volatility that corresponds to the strike and to the expiry date of the Option to be assessed. However, if the expiry date of the Option to be assessed is before (after) the first (last) expiry date of the listed Options series, the Corporation uses the volatilities of the volatility curve of the first (last) expiry date of the listed Option series.

If the Option is not listed and no data is available for it, the Corporation uses the yearly historical volatility of the Option's Underlying Interest price as a proxy for the implied volatility.

6.5 MARGIN INTERVAL

The MI is calculated using the following formula:

$$MI = \alpha \times \sqrt{n} \times \sigma$$

Where 'n' is the MPOR, $'\alpha'$ is equal to the confidence level equivalent to 99.87% (three standard deviations) of the cumulative normal distribution (applicable to all products except for the BAX Futures) or equal to the confidence value equivalent to 99% of the cumulative student's t-distribution with 4 degrees of freedom (applicable to the BAX Futures). 'σ' is the volatility estimator of the contract's returns and is computed using an exponentially weighted moving average (EWMA) approach.

The implemented formula for the estimator at any time *t* is:

$$Intra - Commodity = \alpha \times \sqrt{n} \times \sigma$$

$$\sigma_t = \sqrt{\frac{(1-\lambda)\sum_{i=1}^{260} \lambda^{i-1}(R_{t-i} - \bar{R})^2}{(1-\lambda^{260})}}$$

Where R is the daily price returns of the Underlying Interests for Options and Share Futures and the daily price returns of the Futures prices for Futures (excluding Share Futures), $\bar{R}$ is the mean return over the specified period and λ is the decay factor. CDCC uses λ = 0.99.

In addition, CDCC considers a floor for the EWMA volatility estimator defined above. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. The volatility estimator that will be used to calculate the MI cannot be lower than the calculated floor.

RISK MANUAL

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Glossary

Unless otherwise defined in this Risk Manual, capitalized terms shall have the meanings given to them in the Rules.

Adjusted Base Initial Margin: With respect to Limited Clearing Members, the Base Initial Margin is multiplied by the Effective Ratio. The Effective Ratio is recalibrated on a regular basis as provided in this Manual.

Additional Margin(s): Additional Margins are added to the Base Initial Margin (or Adjusted Base Initial Margin, where applicable) to form part of the Initial Margin in accordance with the methodology set out in this Manual. The Additional Margins include the following: (1) Additional Margin for Market Liquidity Risk, (2) Additional Margin for Specific Wrong-Way Risk, (3) Additional Margin for Mismatched Settlement Risk, (4) Additional Margin for Intra-Day Variation Margin Risk, (5) Additional Margin for Unpaid Premium Exposure Risk, (6) Additional Margin for Banking Holiday Risk, (7) Additional Margin for Variation Margin Delivery Risk, (8) Additional Margin for Capital Risk, (9) Additional Margin for Uncovered Risk of Limited Clearing Members and (10) any other additional Margins as set out in the Rules (other than required pursuant to Rule D-607). When used in the singular form, Additional Margin shall refer to one of the Additional Margins described above, whenever the context so requires.

Additional Margin for Banking Holiday Risk: The Additional Margin for Banking Holiday Risk covers the risk of uncovered exposures arising from new trades during the Banking Holiday and the additional market risk that the Corporation could face during the Banking Holiday.

Additional Margin for Capital Risk: This Margin requirement covers the credit risk of the Clearing Members that arises if the exposure of a Clearing Member to the Corporation is greater than the Clearing Member's capital level.

Additional Margin for Intra-day Variation Margin Risk: This Margin requirement covers the intra-day risk arising in circumstances in which market volatility or surges in trading volumes produce unusually large Variation Margin exposures.

Additional Margin for Market Liquidity Risk: This Margin requirement covers the liquidity risk arising when the Corporation has to close-out positions at a price different than the market price. This liquidity risk could be divided into two components: the first one is the inherent market liquidity risk which is mainly associated to the bid-ask spread, and the second one is the additional liquidity risk due to concentrated positions that cannot be liquidated within the bid-ask spread.

Additional Margin for Mismatched Settlement Risk: This Margin requirement covers the risk arising from a lag between the settlement of positions which otherwise results in a margin offset.

Additional Margin for Specific Wrong-Way Risk: This Margin requirement covers the risk that arises when the exposure of a Clearing Member in its own products is adversely correlated with the creditworthiness of that Clearing Member.

Additional Margin for Uncovered Risk of Limited Clearing Members: This Margin requirement covers the risk exposure that arises if the total value of the risk represented by an LCM to the Corporation is greater than the aggregate amount of the Limited Clearing Member's Adjusted Base Initial Margin and the total value of the Clearing Fund.

The risk represented by the LCM is determined by the Corporation by calculating the estimated loss that the Corporation would face in extreme but plausible market conditions. This Additional Margin is calculated on a daily basis and is required from Limited Clearing Members only.

Additional Margin for Unpaid Option Premium Exposure Risk: The Additional Margin for Unpaid Option Premium Exposure Risk covers the risk incurred by the Corporation in guaranteeing to each Clearing Member the settlement of the Net Daily Premium on a daily basis.

Additional Margin for Variation Margin Delivery Risk: The Additional Margin for Variation Margin Delivery Risk covers the risk incurred by the Corporation in guaranteeing to each Clearing Member having pledged specific securities to cover its Net Variation Margin Requirement, the return of such specific securities, in the event that another Clearing Member to which the specific securities were initially delivered fails to return such specific securities and becomes Non-Conforming or is Suspended. In this case, the Corporation will have to buy the specific securities in the market to return to the Clearing Member that had initially pledged the specific securities.

Banking Holiday: Remembrance Day, in Canada, or any day determined as Remembrance Day by the Corporation through its Holiday Schedule published on a yearly basis.

Base Initial Margin: The Base Initial Margin requirement covers the potential losses that may occur over the next liquidation period as a result of market fluctuations. The Base Initial Margin does not include any Additional Margins.

Boundaries: With respect to the Effective Ratio, the Boundaries refer for a specific period to the upper limit (UB) and lower limit (LB) which are respectively the highest and lowest Daily Ratios during such period.

Clearing Fund Requirement: The Clearing Fund Requirement constitutes the required contribution to the Clearing Fund for each Clearing Member (excluding Limited Clearing Members).

Combined Commodity: Group of positions that are associated with the same Underlying Interest or product or both. Combined Commodity is the lowest level at which the Base Initial Margin for Options, Futures and Unsettled Items is computed.

Daily Ratio: The Daily Ratio is determined, for any Business Day, by dividing the total amount of Clearing Fund Requirements on that Business Day by the aggregate amount of the Base Initial Margin requirement of all Clearing Members (other than Limited Clearing Members) on the same Business Day.

Effective Ratio: Ratio established by the Corporation, in accordance with the governance standards set forth in this Manual, which reflects the multiplier applicable to the Base Initial Margin for Limited Clearing Members.

Expected Shortfall: Average of all losses which are greater than or equal to the worst case. The worst case represents the (1-α)% case, where α is the confidence level.

Haircut: Percentage discounted from the market value of eligible collateral pledged for Margin Deposit. The discount reflects the price movement volatility of the collateral pledged.

Historical Filtered Scenarios: Set of scenarios resulting of a weight applied to the Historical P&L Scenarios to reflect the current volatility. The current volatility is estimated by applying a volatility scaling adjustment using the exponentially weighted moving average (EWMA).

Historical P&L Distribution: Ranking of the Historical P&L Scenarios from the largest loss to the largest profit.

Historical P&L Scenarios: Set of scenarios for a Fixed Income Transaction representing the hypothetical gains and losses derived from Historical Filtered Scenarios. The gains and losses are created by calculating the difference between the price the Fixed Income Transaction under an Historical Filtered Scenario and the initial reference price.

Historical Scenarios: Set of scenarios for a Risk Factor and representing an hypothetical market observation movement reasonably likely to occur, from the current situation to a specific point in time in the future.

Initial Margin: The Initial Margin is composed of the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) and the Additional Margins.

Inter-Commodity: Portfolio containing offsetting positions in highly correlated instruments are subject to credits which reduce the overall Base Initial Margin for Options, Futures and Unsettled Items.

Intra-Commodity: Portfolio containing offsetting positions in different maturity month in the same Combined Commodity are subject to a charge since they may not be perfectly correlated.

Margin Buffer Multiplier: Multiplier to the Base Initial Margin for Fixed Income Transaction to prevent and control potential procyclical effects.

Margin Interval (MI): Parameter established by the Corporation which reflects the maximum price fluctuation that the Underlying Interest could be expected to have during the MPOR. The MI is used to calculate the Base Initial Margin for Options, Futures and Unsettled Items.

Margin Period of Risk (MPOR): The period required by the Corporation to close-out non-concentrated positions in a particular contract (or either through liquidation, auction or by hedging or neutralizing the market risk).

Price Scan Range (PSR): The maximum price movement reasonably likely to occur, during a specified timeframe.

Risk Array: A Risk Array is a set of scenarios defined for a particular contract and representing the hypothetical gain/loss under a specific set of market conditions from the current situation to a specific point in time in the future.

Risk Factor: Factor influencing the value of a Derivative Instrument or OTCI.

Risk Engine: The system used by the Corporation for risk management, risk measurement and calculation of Initial Margin and Clearing Fund Requirement.

Rules: means the Rules of the Corporation, including the Operations Manual and this Manual, as any such rules and manuals may from time to time be amended, changed, supplemented or replaced in whole or in part.

Scanning Risk: The difference between the current market value of an Underlying Interest and its most unfavourable projected liquidation value obtained by shocking the values of the Underlying Interest according to several scenarios representing adverse changes in normal market conditions.

Short Option Minimum: Amount included in the Base Initial Margin to cover the risk exposure arising from deep out-of-the-money short option positions. This amount is required if this amount is higher than the result of the Risk Arrays.

Variation Margin: The Variation Margin covers the risk due to the change in price of a Derivative Instrument or of an OTCI or a change in the Floating Price Rate, in each case since the previous evaluation in accordance with the Rules.

VaR Risk Group(s): Group of Fixed Income Transactions that are associated to similar Risk Factors. VaR Risk Group is the lowest level at which the Base Initial Margin for Fixed Income Transactions is computed.

Volatility Scan Range (VSR): The maximum implied volatility movement reasonably likely to occur, during a specified timeframe.

Volatility Shock(s): Parameter established by the Corporation which reflects the maximum daily volatility fluctuation that the Option contract. The Volatility Shock is used to calculate the Base Initial Margin for Options.

Zero Curve: Specific type of yield curve that associates interest rates on zero coupon bonds to different maturities (tenors). Tenors represent the Risk Factors inputs to evaluate the price of a Fixed Income Transaction using a full revaluation method.

Section 1: Margin Deposits

As set out in the Rules, every Clearing Member shall be obligated to deposit Margin with the Corporation, as determined by the Corporation. Deposits must be made in the form of eligible collateral, as specified in Section 2 of this Risk Manual, in an amount sufficient, taking into account the market value and applicable Haircuts.

The Corporation requires Margin Deposits to cover two types of requirements, namely:

- Margin requirement; and
- Clearing Fund Requirement.

1.1 MARGIN REQUIREMENT

The Margin requirement is composed of the Initial Margin and the Variation Margin.

1.1.1 Initial Margin

The Initial Margin is composed of the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) and the Additional Margins. In order to cover the Initial Margin described below, Clearing Members shall deliver to CDCC an acceptable form of Deposits in accordance with Section 2 of this Risk Manual.

1.1.1.1 Base Initial Margin

The Base Initial Margin requirement covers the potential losses and market risk that may occur as a result of future adverse price and/or Risk Factors across the portfolio of each Clearing Member under normal market conditions.

The risk methodology for the Options, Futures and Unsettled Items incorporates the historical volatility of the daily price returns of the Underlying Interests for Options, Unsettled Items and Share Futures and the daily price returns of the Futures prices for Futures (excluding Share Futures). In addition, as part of the methodology, the Corporation uses a volatility estimator, a confidence level over 99% under the normal distribution or the student's t-distribution assumption and a variable number of days as the MPOR.

The risk methodology for Fixed Income Transactions is the Value at Risk methodology (VaR)[1]. This methodology considers a full revaluation

[1] The same methodology used for Fixed Income Transactions is applied for physical delivery of Government of Canada Bond Futures.

method and it is based on Zero Curves. In addition, as part of the methodology, the Corporation uses a volatility estimator, a Margin Buffer Multiplier to prevent a large decrease in Margin requirements during periods of low volatility, a confidence level over 99% and a variable number of days as the MPOR.

Please refer to Sections 6.1 and 6.2 for additional details on the Base Initial Margin calculation.

With respect to the Limited Clearing Members, the Base Initial Margin is multiplied by the Effective Ratio to calculate the Adjusted Base Initial Margin. Please refer to Section 6.3 for additional details on Effective Ratio Recalibration.

1.1.1.2 Additional Margins

In addition to the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be), the Corporation requires Margin Deposits for the following Additional Margins:

(1) Additional Margin for Market Liquidity Risk

(2) Additional Margin for Specific Wrong-Way Risk

(3) Additional Margin for Mismatched Settlement Risk

(4) Additional Margin for Intra-day Variation Margin Risk

(5) Additional Margin for Unpaid Option Premium Exposure Risk

(6) Additional Margin for Banking Holiday Risk

(7) Additional Margin for Variation Margin Delivery Risk

(8) Additional Capital Margin Risk

(9) Additional Margin for Uncovered Risk of Limited Clearing Members

(10) Any other additional Margins

ADDITIONAL MARGIN FOR MARKET LIQUIDITY RISK

As mentioned in Section 1.1.1.1, the Base Initial Margin requirement is intended to cover potential portfolio losses and market risk over a variable number of days defined as the MPOR. This Additional Margin covers the liquidity risk arising when the Corporation has to close-out positions at a price different than the market price.

The Additional Margin for Market Liquidity Risk methodology will consider an absolute surcharge or a relative surcharge for positions exceeding pre-determined thresholds.

The absolute surcharge is a fixed dollar amount applied on a specific contract or transaction or a group of contracts or transactions. The relative surcharge is applied against the specific Base Initial Margin of the specific contract or transaction or a group of contracts or transactions.

The thresholds are determined based on quantitative adjustments such as the trading volume of the product or Underlying Interest, the volatility of the product or Underlying Interest, and the average amount of bids in the primary market auctions for real return bonds. In addition to these adjustments, the Corporation may also apply qualitative adjustments.

The threshold and surcharge values are updated by CDCC from time to time.

ADDITIONAL MARGIN FOR SPECIFIC WRONG-WAY RISK

The risk covered by the Additional Margin for Specific Wrong-Way Risk arises when the exposure of a Clearing Member in its own products[2] is adversely correlated with the credit worthiness of that Clearing Member. The Additional Margin for Specific Wrong-Way risk aims to measure the risk exposure that represents the net wrong-way exposure less any eligible right-way exposure. For each situation described in the section below, the right-way exposure is limited to the value of the wrong-way risk exposure.

CDCC has identified four particular situations where the risk exists:

- Call Options: When a Clearing Member holds a long Call Option position on the shares issued by itself or its Affiliates, the Option Price or the OTCI Option Price for OTCI Securities Options, as the case may be, is charged as Additional Margin for Specific Wrong-Way Risk. However, the value of all short Call Options for which the Underlying Interest is a security issued by itself or its Affiliates will reduce the amount charged as Additional Margin for Specific Wrong-Way Risk.
- Put Options: When a Clearing Member holds a short Put Option position for which the Underlying Interest is a security issued by itself or its Affiliates, the full strike value amount minus the Option Price

[2] Positions on a security issued by the Clearing Member or its Affiliates or positions for which the Underlying Interest is a security issued by the Clearing Member or its Affiliates.

or the OTCI Option Price for OTCI Securities Options is charged as Additional Margin for Specific Wrong-Way Risk. For long Put Option position for which the Underlying Interest is a security issued by itself or its Affiliates, the Option Price or the OTCI Option Price for OTCI Securities Options minus the full strike value amount is charged as Additional Margin for Specific Wrong-Way Risk.

- Share Futures: When a Clearing Member holds a long Share Futures position for which the Underlying Interest is a security issued by itself or its Affiliates, the full settlement value amount is charged as Additional Margin for Specific Wrong-Way Risk. However, any short Share Futures position for which the Underlying Interest is a security issued by itself or its Affiliates will reduce the amount charged as Additional Margin for Specific Wrong-Way Risk.
- Unsettled Items: When a Clearing Member holds an Unsettled Item position for which the Underlying Interest is a security issued by itself or its Affiliates, the last price of the Underlying Interest is used for the calculation of the Additional Margin for Specific Wrong-Way Risk. Depending if the Unsettled Item position results from an exercise or an assignment, it could either increase or lower the Additional Margin for Specific Wrong-Way Risk.

The Additional Margin for Specific Wrong-Way Risk is netted and capped at the product level. The value cannot be lower than zero.

ADDITIONAL MARGIN FOR MISMATCHED SETTLEMENT RISK

The Additional Margin for Mismatched Settlement Risk is requested if the risk arising from a lag between the settlement of positions results in a margin offset. More specifically, CDCC faces a risk that a Clearing Member settles a position that provides either a Base Initial Margin offset with other positions on the rest of the portfolio.

Given the fact that margin offsets are granted when Fixed Income Transactions portfolios have both long and short positions without taking into account the settlement dates, this Additional Margin charge will be calculated for the positions that could cause mismatched settlement exposure prior to a default.

In order to address such risk, CDCC will perform forward looking analysis to forecast material changes in the Base Initial Margin as a result of settlements of Fixed Income Transactions.

The Additional Margin for Mismatched Settlement Risk will be calculated by using the maximum of several scenarios representing the potential cases that may trigger a Mismatched Settlement Risk following the settlement of positions, minus the Base Initial Margin.

ADDITIONAL MARGIN FOR INTRA-DAY VARIATION MARGIN RISK

The risk covered by the Additional Margin for Intra-Day Variation Margin Risk arises when market volatility of cleared volumes produces unusually large Variation Margin exposures. The Additional Margin for Intra-day Variation Margin Risk requirement corresponds to the sum of the Additional Margin for Intra-day Variation Margin Risk in respect of Futures and the Additional Margin for Intra-day Variation Margin Risk in respect of Fixed Income Transactions. When calculating the value of Additional Margin for Intra-day Variation Margin Risk for Futures or Fixed Income Transactions, the value cannot be lower than zero.

In order to address the Intra-Day Variation Margin Risk, the Corporation may call for Additional Margin from each Clearing Member if it determines that the intra-day exposure for Futures and/or Fixed Income Transactions of the Clearing Member exceeds certain limits (thresholds expressed in percentage) in relation to the Clearing Member's respective Base Initial Margin. The Additional Margin for Intra-Day Variation Margin Risk is subject to a minimum value (floor).

ADDITIONAL MARGIN FOR UNPAID OPTION PREMIUM EXPOSURE RISK

The Additional Margin for Unpaid Option Premium Exposure Risk covers the risk incurred by the Corporation in guaranteeing to each Clearing Member the settlement of the Net Daily Premium on a daily basis. To cover this potential risk, the Corporation accumulates during the Business Day the value of the trades that are not yet settled. At the time of the calculation, if a Clearing Member is expected to make a cash settlement to the Corporation, the value is requested from the Clearing Member, as Additional Margin for Unpaid Option Premium Exposure Risk.

ADDITIONAL MARGIN FOR BANKING HOLIDAY RISK

This Additional Margin considers the risk associated to uncovered exposures arising from new trades and the additional market risk that the Corporation could face during the Banking Holiday.

The incremental exposure is based on the historical fluctuation of the Base Initial Margin requirement over a specific period and it is designed to capture the potential uncovered Base Initial Margin requirement arising from new trades during the Banking Holiday.

With respect to the additional market risk, one (1) more Business Day is added to the MPOR of the Base Initial Margin requirement for the eligible tradeable products during the Banking Holiday. This Base Initial Margin requirement is then compared to the Base Initial Margin calculated with the MPOR. The difference between the two values corresponds to the additional market risk.

ADDITIONAL MARGIN FOR VARIATION MARGIN DELIVERY RISK

This Margin requirement covers the risk incurred by the Corporation in guaranteeing to each Clearing Member having pledged specific securities to cover its Net Variation Margin Requirement, the return of such specific securities, in the event that another Clearing Member to which the specific securities were initially delivered fails to return such specific securities and becomes Non-Conforming or is Suspended. In this case, the Corporation will have to buy the specific securities in the market to return to the Clearing Member that had initially pledged the specific securities. To cover this potential risk, an amount representing a percentage of the total Variation Margin requirement or a specific percentage set at the securities level will be collected from the Clearing Member who initially receives the specific securities, as Additional Margin for Variation Margin Delivery Risk.

ADDITIONAL CAPITAL MARGIN RISK

This Additional Margin intends to measure the credit exposure of all Clearing Members (excluding Limited Clearing Members) that arises if the exposure of a Clearing Member is superior to its capital amount.

The Corporation compares the Clearing Member’s capital amount to the Base Initial Margin. In the event that the Base Initial Margin of the Clearing Member exceeds the capital amount, Additional Margin in the amount of the excess will be collected from the Clearing Member.

The capital level is derived from regulatory reports received on a regular basis. The Corporation uses the net allowable assets, the net Tier 1 capital or any other comparative measure to assess the capital level of each Clearing Member.

ADDITIONAL MARGIN FOR UNCOVERED RISK OF LIMITED CLEARING MEMBERS

This Additional Margin covers the risk exposure that arises if the total value of the risk represented by an LCM to the Corporation is greater than the aggregate amount of the Limited Clearing Member's Adjusted Base Initial Margin and the total value of the Clearing Fund.

The risk represented by the LCM is determined by the Corporation by calculating the estimated loss that the Corporation would face in extreme but plausible market conditions. This Additional Margin is calculated on a daily basis and is required from Limited Clearing Members only.

ANY OTHER ADDITIONAL MARGINS

Any other additional Margins as set out in the Rules (other than required pursuant to Rule D-607).

1.1.2 Variation Margin

The Variation Margin requirement covers the risk due to the change in price of a Derivative Instrument or an OTCI or a change in the Floating Price Rate since the previous evaluation in accordance with the Rules. The following table evidences the type of Variation Margin coverage that will be required by CDCC for each type of products:

Products	Variation Margin coverage type
Options	Collateralized
Futures	Cash settled
Fixed Income Transactions	Collateralized (subject to Variation Margin process)
Unsettled Items	Collateralized

1.1.2.1 Options

For Options, the Variation Margin is collateralized every Business Day and at each Intra-Day Margin Call based on the Option Price reported by the Exchange, or the last OTCI Option Price for OTCI Securities Options[3], as the case may be, and, in the event of the unavailability or inaccuracy of such price, the Corporation shall set such price in accordance with the best information available as to the correct price.

[3] Please refer to Section 6.4 for additional details on the theoretical price calculation of OTCI Securities Options.

1.1.2.2 Futures

For Futures, the Variation Margin is cash settled every Business Day based on the last Settlement Price reported by the Exchange, and, in the event of the unavailability or inaccuracy of such price, the Corporation shall set the last Settlement Price in accordance with the best information available as to the correct price.

1.1.2.3 Fixed Income Transactions

The Variation Margin Requirement[4] in respect of each Fixed Income Transaction is calculated on a daily basis and represents the sum of the Price Valuation Requirement and the Repo Rate Requirement, each as defined in Section D-601 of the Rules.

PRICE VALUATION REQUIREMENT

The Price Valuation Requirement represents, in respect of a Repurchase Transaction, an amount which is the aggregate amount calculated in respect of the difference between (i) the Market Value of the Purchased Security and (ii) the Repurchase Price of the Repurchase Transaction, plus any Coupon Income payable to the holder between the calculation date and the Repurchase Date, and, in respect of a Cash Buy or Sell Trade, an amount which is the difference between (i) the Market Value of the Purchased Security and (ii) the Purchase Price of the Cash Buy or Sell Trade; which amount is owed to the Corporation by a Fixed Income Clearing Member that is a party to such Repurchase Transaction or Cash Buy or Sell Trade or by the Corporation to such Fixed Income Clearing Member.

REPO RATE REQUIREMENT

The Repo Rate Requirement represents a change in the current Floating Price Rate and means, in respect of a Repurchase Transaction, an amount which is calculated in respect of the difference between the Floating Price Rate and the Repo Rate; which amount is owed to the Corporation by a Fixed Income Clearing Member that is a party to such Repurchase Transaction or by the Corporation to such Fixed Income Clearing Member.

[4] The Variation Margin Requirement for Fixed Income Transactions is not applied for physical delivery of Government of Canada Bond Futures. The applicable Variation Margin Requirement for Fixed Income Transactions is rounded up to the nearest $1 of nominal value.

1.1.2.4 Unsettled Items

The Variation Margin for Unsettled Items with respect to both Options and Futures is collateralized. With respect to Variation Margin for Unsettled Items related to Options, the Corporation calculates a Variation Margin requirement equal to the intrinsic value of the Option multiplied by the position and the contract size. With respect to Variation Margin for Unsettled Items related to Futures, the Corporation calculates a Variation Margin requirement equal to the difference between the last Settlement Price of the Futures and the price of the Underlying Interest related to the Futures, multiplied by the position and the contract size.

1.1.3 Account Structure, Netting and Risk Aggregation

1.1.3.1 Short Positions, Account Types and Positions Netting

Clearing Members shall not be required to deposit Margin in respect of Short Positions in Futures or Options for which they have deposited the Underlying Interest in accordance with Section A-708 of the Rules.

The Corporation uses three types of accounts for Margin calculation purposes and positions management: Firm Account, Multi-Purpose Account and Client Account.

- For all account types, the Margin requirement for Futures positions and Fixed Income Transactions is calculated on a net basis.
- The Margin requirement for Options is calculated on a net basis for the Firm Account and the Multi-Purpose Account, but on a gross basis for the Client Account, which means that only short Options are considered when computing the Initial Margin.

1.1.3.2 Margin Aggregation

The total Margin requirement of each Clearing Member is composed of the Initial Margin requirement and the Variation Margin requirement.

The calculation is made at the account level and then aggregated at the Clearing Member level. However, operationally the Margin requirement is subject to the following aggregation, subject to the applicable type of products being cleared by the Clearing Member:

INITIAL MARGIN REQUIREMENT (including the Variation Margin for Options and Unsettled Items)

The Initial Margin requirement for all products is aggregated with the Variation Margin for Options and Unsettled Items as follows:

a) The Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) is calculated at the account level. For Options, Futures and Unsettled Items, the margin results are calculated at the Combined Commodity level and the Base Initial Margin corresponds to the sum all Combined Commodities. For Fixed Income Transactions, the Base Initial Margin represents the sum of all VaR Risk Groups. The Base Initial Margin at the account level corresponds to the sum of the Base Initial Margin for Options, Futures and Unsettled Items and the Base Initial Margin for Fixed Income Transactions.

b) The Variation Margin for Options and Unsettled Items is calculated at the account level and then added to the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be).

- If the Variation Margin for Options and Unsettled Items is negative, this will result in a margin credit[5] decreasing the aggregate value of the Base Initial Margin for Options, Futures and Unsettled Items.
- If the Variation Margin for Options and Unsettled Items is positive, this will result in a margin debit increasing the aggregate value of the Base Initial Margin for Options, Futures and Unsettled Items.

c) The Margin requirement in respect of each Clearing Member is calculated by aggregating for all accounts the value of (1) the Base Initial Margin (or Adjusted Base Initial Margin, as the case may be) and the Variation Margin for Options and Unsettled Items and (2) the following Additional Margins calculated at the Clearing Member level: Additional Margin for Market Liquidity Risk, Additional Margin for Specific Wrong-Way Risk, Additional Margin for Mismatched Settlement Risk, Additional Margin for Intra-Day Variation Margin Risk, Additional Margin for Unpaid Option Premium Exposure Risk, Additional Margin for Banking Holiday Risk, Additional Margin for Variation Margin Delivery Risk, Additional Capital Margin Risk,

[5] For a given account, the margin credit is capped to the Base Initial Margin for Options, Futures and Unsettled Items.

Additional Margin for Uncovered Risk of Limited Clearing Members and any other additional Margins as set out in the Rules.

VARIATION MARGIN FOR FUTURES

The Variation Margin for Futures (the net value of Gains and Losses) is aggregated at the Clearing Member level.

VARIATION MARGIN FOR FIXED INCOME TRANSACTIONS

The Variation Margin Requirement for Fixed Income Transactions is aggregated at the Clearing Member level.

1.2 CLEARING FUND REQUIREMENT

Rule A-6 governs the rights and obligations of the Corporation and the Clearing Members, excluding Limited Clearing Members (LCMs), with respect to the Clearing Fund.

The Clearing Fund is a reserve fund put in place by the Corporation to absorb the deficit that may occur upon the default of a Clearing Member and its Affiliates when the suspended Clearing Member's prefunded financial resources do not cover its market exposure.

This fund is structured to mitigate the largest Uncovered Residual Risk under extreme but plausible market conditions of all Clearing Members (excluding LCMs) and of their Affiliate(s).

On a monthly basis, the Clearing Fund is reviewed and updated according to the following methodology which considers two specific elements:

- The size of the Clearing Fund is based on the largest Uncovered Residual Risk of all Clearing Members and of their Affiliate(s) (excluding LCMs) over the last sixty (60) Business Days. The size is then increased by 15%.
- Each Clearing Member's Clearing Fund Requirement amount is equal to the weight of its respective Base Initial Margin over the last sixty (60) Business Days multiplied by the size of the Clearing Fund. A Clearing Member's contribution is subject to a minimum floor (Base Deposit), which varies according to the Clearing Member's type of activity.

On an intra-month basis, the Corporation monitors and controls the size of the Clearing Fund and may adjust it upward between monthly re-evaluations. If the largest Uncovered Residual Risk exceeds 90% of the size of the Clearing Fund but is inferior to 100% of the size of the Clearing Fund, the size of the Clearing Fund is increased by 15% of the current size. If the largest Uncovered Residual Risk exceeds 100%, the size of the Clearing Fund is updated based on the methodology described above.

Section 2: Eligible Collateral

As set out in Section 1 of the Risk Manual, every Clearing Member shall be obligated to deposit Margin with the Corporation, as determined by the Corporation. Deposits must be made in the form of eligible collateral, as specified in this section, in an amount sufficient, taking into account the market value and applicable Haircuts.

2.1 FORMS OF COLLATERAL

The forms of eligible collateral that may be deposited by or on behalf of a Clearing Member with CDCC, as prescribed in Rule A-6 (Clearing Fund Deposits) and Rule A-7 (Margin requirements), are one or more of the following assets:

1) Cash
2) Debt Securities
3) Valued Securities

CDCC may, on an exceptional and temporary basis at its sole discretion, exclude certain forms of eligible collateral or accept other forms of collateral.

2.2 CASH

Cash amounts are accepted only in Canadian dollars.

2.3 DEBT SECURITIES

2.3.1 General Considerations

Debt Securities which fulfill certain minimum criteria may be deemed as an eligible form of collateral.

Acceptance of a Debt Security is conditional on the availability of a price from a source that CDCC determines to be acceptable and reliable.

CDCC establishes, reviews and publishes the list of eligible Debt Securities on a regular basis.

Irrespective of the fact that a Debt Security fulfils all eligibility criteria, CDCC will not accept as collateral from or on behalf of a Clearing Member any Debt Security issued or guaranteed by the Clearing Member itself or its Affiliates.

2.3.2 Types of Debt Securities

The Debt Security must be a debt instrument having a fixed and unconditional principal amount.

The coupon rate of the debt instrument must be fixed. Zero coupon bonds are eligible.

Furthermore, real return bonds can be eligible for a specific issuer as determined by CDCC on the list of eligible Debt Securities.

The Debt Security must not have an embedded option or carry a right of conversion into equity securities, with the exception of non-financial calls (i.e. “Canada Call”).

Saving Bonds, floating rate notes, stripped coupons and residual securities and are excluded.

2.3.3 Types of Issuers

The eligible Debt Securities must be issued or guaranteed by the Government of Canada, by a provincial government or by the United States (“U.S.”) Government.

2.3.4 Eligible Debt Securities by Issuer

2.3.4.1 Debt Securities issued by the Government of Canada:

- Treasury bills, bullet bonds and real return bonds.

2.3.4.2 Debt Securities guaranteed by the Government of Canada:

- Treasury bills, bullet bonds and Debt Securities issued by Canada Housing Trust.

2.3.4.3 Debt Securities issued by a provincial government:

- Treasury bills and bullet bonds issued by the governments of Alberta, British Columbia, Manitoba, Ontario and Quebec.

2.3.4.4 Debt Securities guaranteed by a provincial government:

- Bullet bonds issued by Financement Quebec, Hydro-Quebec and Ontario Electricity Financial Corporation.

2.3.4.5 Debt Securities issued by the U.S. Government

- Treasury bills, notes, bonds, and Treasury inflation-protected securities (TIPS).

2.3.5 Settlement Procedures

Debt Securities must be transferable in book-entry form using CDSX of CDS Clearing and Depository Services Inc.

2.3.6 Currency of Denomination

Debt Securities must be denominated in Canadian dollars with the exception of Debt Securities issued by the U.S. Government denominated in U.S. dollars.

2.4 VALUED SECURITIES

2.4.1 General Considerations

CDCC accepts Valued Securities trading on the Toronto Stock Exchange or the TSX Venture Exchange.

Irrespective of the fact that a Valued Security fulfils all eligibility criteria, CDCC will not accept as collateral from or on behalf of a Clearing Member any Valued Security issued or guaranteed by the Clearing Member itself or its Affiliates.

No value will be recognized for a Valued Security whose closing price is below $10 per share.

2.4.2 Settlement Procedures

Valued Securities must be transferable in book-entry form using CDSX of CDS Clearing and Depository Services Inc.

2.4.3 Currency of Denomination

Valued Securities must be denominated in Canadian dollars.

2.5 RISK CONTROL MEASURES

2.5.1 General Considerations

The CDCC collateral framework takes a conservative approach to manage the forms of eligible collateral accepted. The framework includes, but is not limited to, risk limits and calculation of Haircuts that apply to the different forms of eligible collateral.

2.5.2 Risk Limits

2.5.2.1 Limits at the Clearing Member Level

- Except for the Variation Margin account, for each acceptable Government Debt Security, excluding Treasury bills, a concentration limit equal to $250 million or 10% of the total issue outstanding, whichever is less, is applied to each Clearing Member.

- Valued Securities issued or guaranteed by the Clearing Member or its Affiliates are not eligible.
- Valued Securities issued by the TMX Group are not eligible.

2.5.2.2 Limit on the Clearing Fund Account

For each Clearing Member, for all of its accounts combined, 100% of the Clearing Fund Requirements must be covered by Cash, acceptable Treasury bills issued by the Government of Canada or any combination thereof after the application of Haircuts.

2.5.2.3 Limit on the Margin Requirements[6]

For each Clearing Member, for all of its accounts combined, at least 25% of the Margin requirements must be covered by Cash, acceptable Treasury bills and bonds issued or guaranteed by the Government of Canada or any combination thereof valued after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 40% of the Margin requirements may be covered by Debt Securities issued by the United States of America Federal Government after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 50% of the Margin requirements may be covered by provincial issued or guaranteed Debt Securities after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 20% of the Margin requirements may be covered by Debt Securities issued or guaranteed by the province of Alberta after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 20% of the Margin requirements may be covered by Debt Securities issued or guaranteed by the province of British Columbia after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 20% of the Margin requirements may be covered by Debt Securities issued or guaranteed by the province of Manitoba after the application of Haircuts.

[6] This excludes the Net Variation Margin Requirement.

For each Clearing Member, for all of its accounts combined, no more than 30% of the Margin requirements may be covered by Debt Securities issued or guaranteed by the province of Ontario after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 30% of the Margin requirements may be covered by Debt Securities issued or guaranteed by the province of Quebec after the application of Haircuts.

For each Clearing Member, for all of its accounts combined no more than 15% of the Margin requirements may be covered by Valued Securities after the application of Haircuts.

For each Clearing Member, for all of its accounts combined, no more than 5% of the Margin requirements may be covered by any one Valued Security after the application of Haircuts.

2.5.2.4 Limit on the Variation Margin Account

For each Clearing Member, for all of its accounts combined, 100% of the Net Variation Margin Requirement must be covered by acceptable Treasury bills and bonds issued or guaranteed by the Government of Canada, Government of Alberta, Government of British Columbia, Government of Ontario and Government of Quebec or any combination thereof after the application of Haircuts.

CDCC shall, on an exceptional basis, acting reasonably, accept cash or other securities as collateral to cover the Net Variation Margin Requirement.

2.5.3 Limits at CDCC Level

For each acceptable Valued Security, a concentration limit of 5% of the free float applies at CDCC level.

2.6 HAIRCUTS

2.6.1 Haircuts for Government Securities

The Corporation calculates the Haircuts based on any of the following criteria:

- Valuation of the market, credit, liquidity and foreign exchange risks based on historical daily returns;
- The volatility estimator uses the exponentially weighted moving average ("EWMA") approach as defined in Appendix 6.5, and the assumption that the

bond can be liquidated at a reasonable price in “n” days. (“n” is determined according to the type of products and prevailing market conditions). In addition, a floor for the EWMA volatility estimator is calculated as the 25th percentile of a daily EWMA volatility estimator observed over the last 10 years;

- Liquidity risk valued according to the bid-ask spread of the issues using the same EWMA volatility estimator and the floor (if this spread is unavailable, the liquidation window will be expanded and will depend on market conditions);
- Bonds of the same issuer and comparable maturities.

Once the quantitative analysis is performed, CDCC reserves the right to increase the Haircuts based on qualitative criteria, such as:

- Comparative analysis of CDCC’s Haircuts in relation to the Haircuts of the Bank of Canada;
- Comparative analysis of CDCC’s Haircuts in relation to the Haircuts of other clearing houses;
- The congruence of the different Haircuts to the credit rating spreads of the different issuers; and
- Any other factor considered relevant by CDCC, acting reasonably.

2.6.2 The Haircuts for Valued Securities

A Haircut of 50% is applied to all Valued Securities pledged against the total Margin requirement for all accounts combined.

2.6.3 Haircuts Policy

CDCC reviews and publishes the Haircuts from time to time, and the Clearing Members are informed of these reviews by written notice.

Section 3: Monitoring Program

3.1 BACKTESTING

The Corporation monitors the daily performance of the models through the backtesting and sensitivity analysis. The backtesting is used as a tool to validate the models, but it is not limited to model validation.

In addition, a Clearing Member's portfolio is backtested on a daily basis and the results are monitored by the Corporation.

3.2 STRESS TESTING

The CDCC stress testing management framework takes a conservative approach to create and revise stress tests scenarios. The Corporation uses different historical and theoretical stress scenarios, each of them designed to test different relevant Risk Factors. The framework includes, but is not limited to, the assessment of the new scenarios and the monitoring of the Risk Factors and stress test scenarios and correction measures if the daily results are not satisfactory.

The stress testing management framework is revised by CDCC from time to time.

3.3 CLEARING MEMBERS CREDIT RISK MONITORING

CDCC performs a qualitative analysis of the financial statements of each Clearing Member. CDCC has defined specific thresholds to analyze the profitability, the regulatory margin and capital obligations, the liquidity and the capital level of each Clearing Member. As a result of its analysis, the Corporation may require such additional information from its Clearing Members as may be reasonably necessary. On the basis of the above analysis, the Corporation will determine if it is necessary to take any additional actions.

Section 4: Contract Adjustment

Section A-902 of the Rules prescribes the cases in which a contract adjustment may be made.

The Corporation is responsible for monitoring and identifying the corporate events that may result in a contract adjustment. It interprets the information and communicates it to the Adjustment Committee as soon as possible. The Adjustment Committee acts in accordance with the provisions of Rule A-9.

A meeting of the Adjustment Committee is called by the Corporation, whenever circumstances require. The Adjustment Committee is responsible for preparing the draft notices to the Clearing Members which, once approved by the Adjustment Committee members, are published to the attention of the Clearing Members and the market participants.

Section 5: Acceptability of Underlying Interests

5.1 ACCEPTABLE UNDERLYING INTERESTS OF SECURITIES OPTIONS

- Section B-603 of the Rules sets out the eligibility criteria for Securities Options.
- Section B-604 of the Rules sets out the ineligibility criteria for Securities Options.
- Section B-605 of the Rules sets out the eligibility criteria for ETF Securities as Underlying Interests of Options.
- Section B-606 of the Rules sets out the ineligibility criteria for ETF Securities as Underlying Interests of Options.

CDCC reviews and publishes, from time to time, the eligibility threshold and ineligibility threshold in terms of Value of Available Public Float and volume (expressed as an average daily North American Volume of the last 20 Business Days) for clearing Securities Options.

5.2 ACCEPTABLE UNDERLYING INTERESTS OF SHARE FUTURES

- Section C-1503 of the Rules sets out the eligibility criteria for Share Futures.
- Section C-1504 of the Rules sets out the ineligibility criteria for Share Futures.

CDCC reviews and publishes, from time to time, the eligibility threshold and ineligibility threshold in terms of Value of Available Public Float and volume (expressed as an average daily North American Volume of the last 20 Business Days) for clearing Share Futures.

5.3 ACCEPTABLE UNDERLYING INTERESTS OF OTCI SECURITIES OPTIONS

- Section D-104 of the Rules sets out the acceptance criteria for OTCI Securities Options.

CDCC reviews and publishes, from time to time, on its website a list of Acceptable Underlying Interests for clearing OTCI Securities Options.

Between two publications of the list of Acceptable Underlying Interests, a Clearing Member who wishes to clear OTCI Securities Options for which an Underlying Interest is not included on the list must obtain the Corporation's prior approval. The Underlying Interest must at least meet the acceptance criteria prescribed in Section D-104 of the Rules.

5.4 ACCEPTABLE UNDERLYING INTERESTS OF CASH BUY OR SELL TRADES

For the application of Sections D-104 and D-603 of the Rules, Securities are acceptable for Cash Buy or Sell Trades clearing if they meet the following criteria:

- The issuer must be eligible, which includes the following issues:

- Bonds and Treasury bills issued by the Government of Canada, including real return issues;
- Canada Mortgage and Housing Corporation debt securities;
- Bonds issued by Business Development Bank of Canada;
- Bonds issued by Export Development Canada;
- Bonds issued by Farm Credit Canada;
- Bonds issued by Canada Post; and
- Bonds issued by certain provincial governments and provincial Crown corporations determined as acceptable by CDCC, excluding real return bonds, zero coupon bonds, and bonds with a maturity of less than one year.
  - The bonds must be repayable at maturity;
  - The bonds must be denominated in Canadian dollars;
  - The coupon type must be fixed, adjusted for the inflation or zero (Treasury bills are eligible);
  - The net amount outstanding[7] must be greater than or equal to $250 million;
  - The bonds' prices must be issued by a source that is acceptable to the Corporation.

5.5 ACCEPTABLE UNDERLYING INTERESTS OF REPURCHASE TRANSACTIONS

For the application of the provisions of Sections D-104 and D-603 of the Rules, Securities are eligible for clearing of Repurchase Transactions if they meet the following criteria:

- The Underlying Interest must be an Acceptable Underlying Interest of Cash Buy or Sell Trades;
- The Purchase Date of the Repurchase Transaction must be no earlier than the Novation Date;
- The Repurchase Date of the Repurchase Transaction must not be more than 365 days later than the Purchase Date of the Repurchase Transaction and must be no later than the maturity date of the Acceptable Security.

[7] The net amount outstanding is defined as the outstanding amount issued on the market minus the stripped coupon bonds and issuer repurchases.

Section 6: Appendix

6.1 BASE INITIAL MARGIN CALCULATION FOR OPTIONS, FUTURES AND UNSETTLED ITEMS[8]

For greater certainty, this sections only applies to Options, Futures and Unsettled Items.

To calculate the Base Initial Margin the risk methodology is based on the PSR and the VSR which are then converted into the Scanning Risk parameter. The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price[9]. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others.

The Scanning Risk is calculated at the Combined Commodity level and is denominated in the same currency as the contract. For contracts belonging to the same Combined Commodity, the Risk Array results are added up for all contracts under the same scenario. The highest loss represents the Scanning Risk.

The other variables influencing the value of the Base Initial Margin are the Intra-Commodity, the Inter-Commodity and the Short Option Minimum. The following table summarizes the variables used in the calculation.

Input variables to calculate the Base Initial Margin	Options	Futures	Unsettled Items
Scanning Risk	•	•	•
Intra-Commodity		•	
Inter-Commodity[10]		•	
Short Option Minimum	•		

8 Unsettled Items resulting of a physical delivery of Government of Canada Bond Futures are margined under the VaR methodology.

9 The initial reference price is the market price or the theoretical price derived from market observations.

10 Not applicable for Share Futures.

6.1.1 Scanning Risk

The Scanning Risk parameter represents the difference between the most unfavourable projected liquidation value and the initial reference price. The most unfavourable projected liquidation value amongst the Risk Array is obtained by varying the values of the Underlying Interest and implied volatility according to several scenarios representing adverse changes in normal market conditions. The table at the end of this section shows all the risk scenarios. The projected liquidation values are obtained using specific valuation models such as Black 76, Black-Scholes, Binomial and others. If the largest loss is negative, the Scanning Risk is set to zero. The Scanning Risk is then compared to the Short Option Minimum. This amount is required if the Short Option Minimum is higher than the result of the Risk Arrays.

6.1.1.1 Price Scan Range

The term PSR represents the potential variation of the contract value and it is calculated through the following formula:

$$PSR = \ Price \ \times MI \ \times Contract\ Size$$

The methodology for the MI is detailed in Section 6.5.

6.1.1.2 Volatility Scan Range

The term VSR represents the potential variation of the implied volatility and it is calculated through the following formula:

$$VSR = \ Volatility\ Shock \ \times \sqrt{n}$$

Where 'n' is the MPOR, and 'Volatility Shock' represents the 95% confidence level of the historical daily fluctuations for the series volatility over a one year look-back period. The daily fluctuations are scaled up with the use of MPOR. VSR values are subject to a floor value and a cap value.

Risk Scenarios	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Underlying Price Variation *	0	0	1/3	1/3	-1/3	-1/3	2/3	2/3	-2/3	-2/3	1	1	-1	-1	2	-2
Volatility Variation *	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	0	0
Weight Fraction Considered	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	35%	35%

* Expressed in scan range

The MI, MPOR and Volatility Shocks values are updated by CDCC from time to time.

6.1.2 Intra-Commodity

Long positions on Futures maturing in one month are automatically matched with short positions on Futures maturing in another month. The resulting Base Initial Margin on these two Futures belonging to the same Combined Commodity, could be lower than the real risk associated with the combination of the two contracts. In order to cover this inter-month spread risk, a charge is included in the Base Initial Margin.

For the Futures, the Intra-Commodity which is an additional dollar amount charge applied to each combination of two different Futures, is determined as follows:

$$Intra - Commodity = \alpha \times \sqrt{n} \times \sigma$$

Where 'n' is the number of MPOR, $'\alpha'$ is equal to the confidence value equivalent to 99.87% (three standard deviations) of the cumulative normal distribution (applicable to all products except for the Three-Month Canadian Bankers' Acceptance Futures (BAX)) or equal to the confidence value equivalent to 99% of the cumulative student's t-distribution with 4 degrees of freedom (applicable to the BAX Futures). 'σ' is the volatility estimator of the Futures combination's daily profit and loss over the reference period and is computed using the EWMA approach. Further details on the EWMA are described in Appendix 6.5.

In addition, CDCC considers a floor for the EWMA volatility estimator. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. The EWMA volatility estimator that will be used to calculate the Intra-Commodity cannot be lower than the calculated floor.

With respect to the BAX, CDCC calculates the Intra-Commodity for all combinations of spreads and butterfly strategies and applies a same charge for a same group of combinations with close maturities. If multiple Intra-Commodity are defined, the Corporation will prioritize the ones providing the lowest Base Initial Margin.

The combinations and the spread priorities for the Intra-Commodity are updated by CDCC from time to time.

6.1.3 Inter-Commodity

The Corporation may consider the correlation that exists between different Futures when calculating the Base Initial Margin. The Corporation will grant a credit according to the historical correlation of the returns of the two Futures. If multiple Inter-Commodity are defined, the Corporation will prioritize the ones with the highest correlation.

The Inter-Commodity and the spread priorities are updated by CDCC from time to time.

6.2 BASE INITIAL MARGIN CALCULATION FOR FIXED INCOME TRANSACTIONS

For greater certainty, this section only applies to Fixed Income Transactions.

To calculate the Base Initial Margin, the VaR methodology is based on Historical Scenarios for all relevant Risk Factors. The Historical Scenarios consist of a set of scenarios for a Risk Factor over a relevant historical period that represents an hypothetical market observation movement (shocked market observation based on market history) reasonably likely to occur, from the current situation to a specific point in time in the future.

For Fixed Income Transactions, the Risk Factors are the Zero Curves. On any given Business Day, the shocks derived from the Historical Scenarios are applied to the initial reference market inputs values. The difference between the initial reference price and the shocked historical price represents an Historical P&L Scenario. The initial reference price and historical shocked price are derived respectively from the initial reference Zero Curves and the shocked Zeros Curve using a full revaluation method.

The Historical P&L Scenarios are calculated at the VaR Risk Group level and are denominated in the same currency as the Fixed Income Transactions. For Fixed Income Transactions belonging to the same VaR Risk Group, the Historical P&L Scenarios results are added up for Fixed Income Transactions.

Lastly, the Historical P&L Scenarios are ranked to derive the Historical P&L Distribution that is used to calculate the average loss of the portfolio using the Expected Shortfall method. A Margin Buffer Multiplier is then applied to the Expected Shortfall value to obtain the Base Initial Margin.

The main steps to calculate the Base Initial Margin are described in the section below.

6.2.1 Historical Filtered Scenarios

The Historical Filtered Scenarios are generated using the initial reference Risk Factors value and historical observations of different tenors on the Zero Curves.

The shocked Risk Factors are calculated using the following formula:

$$y'_{t,\tau} = y_{T,\tau}(1 + R_{t,\tau}c_{t,\tau})$$

Where c is the scaling factor for the volatility scaling adjustment and R is the daily relative market return over the Margin Period of Risk 'n'. CDCC uses a look-back period of 5 years.

The scaling factor formula at time t and for a given tenors is calculated using the following formula:

$$c_{t,\tau} = Max\left(\frac{\sigma_{T,\tau} + \sigma_{t,\tau}}{2\,\sigma_{t,\tau}}, Min\ SF\right)$$

Where σ is the EWMA volatility forecast and Min SF is the minimal scaling factor.

The implemented formula for the EWMA volatility forecast is:

$$\sigma_{t,\tau}^2 = (1-\lambda)R_{t-1,\tau}^2 + \lambda\sigma_{t-1,\tau}^2 \ ,$$

Where R is the relative market return over the Margin Period of Risk 'n' and λ is the decay factor. CDCC uses λ = 0.99. The Min SF is updated by CDCC from time to time.

6.2.2 Historical P&L Scenario generation

The Historical P&L Scenarios are valued by calculating the difference between the shocked prices of Fixed Income Transactions under an Historical Filtered Scenario and the initial reference prices. The Historical P&L Scenarios results are added up for all Fixed Income Transactions within a VaR Risk Group.

The initial reference prices are calculated using a full revaluation method and the initial reference Risk Factors. The shocked prices are calculated using a full revaluation method and the shocked Risk Factors.

6.2.3 Expected Shortfall

For each VaR Risk Group, the Historical P&L is sorted from largest loss to largest profit to construct the Historical P&L Distribution. Using a confidence value equivalent to 99.64% and the Historical P&L Distribution, the Expected Shortfall is determined by averaging the losses exceeding the confidence value.

6.2.4 Margin Buffer Multiplier

The Base Initial Margin for each VaR Risk Group is obtained by applying a Margin Buffer Multiplier to the Expected Shortfall value.

The Margin Buffer Multiplier is based on the ratio of the average 10 years volatility and the previous month volatility. CDCC will change the Margin Buffer Multiplier level if it is deemed stable for at least 3 consecutive months. The ratio is then rounded to the nearest 0.25. A floor of 1 and a cap value of 1.5 are applied.

The Margin Buffer Multiplier is updated by CDCC from time to time.

6.3 RECALIBRATION OF THE EFFECTIVE RATIO

The Base Initial Margin requirement of each Limited Clearing Member is affected by a multiplication factor (the “Effective Ratio”).

Objective: The Recalibration Methodology (as defined below) ensures that the Effective Ratio remains continuously consistent with the ratio of the total Clearing Fund Requirements on the total Base Initial Margin for all Clearing Members (excluding Limited Clearing Members) and addresses the permanence and persistence of a change.

Trigger: The Corporation shall review the Effective Ratio annually, and may review the Effective Ratio at any time following a change to the CDCC risk model which is required in order to comply on an ongoing basis with the regulatory requirements applicable to CDCC (“Risk Model Change”). Following such review, CDCC may recalibrate the Effective Ratio in accordance with the methodology set forth below (the “Recalibration Methodology”). For further clarity, a Risk Model Change captures both changes required by CDCC to comply on an ongoing basis with its current regulatory requirements and changes required to comply on an ongoing basis with applicable regulatory requirements.

6.3.1 Recalibration Methodology

The Effective Ratio (“ER”) shall be re-calibrated if the value of the ER, at the time of the calculation, is not within the range determined by the UB and LB (as defined below):

- Where the current ER is within one plus the Boundaries (defined below) applicable to a given period, no recalibration will be made to the Effective Ratio.

- The **Boundaries** refer to the upper limit (UB) and lower limit (LB) which are respectively the highest and lowest Daily Ratios over a specific period.
- The **Daily Ratio** is determined, for any Business Day, by dividing the total amount of Clearing Fund Requirements on that Business Day by the aggregate amount of the Base Initial Margin requirements of all Clearing Members (other than Limited Clearing Members) on the same Business Day.

- Where the current ER is outside one plus the Boundaries applicable to a given period, this will constitute a recalibration event (a "Recalibration Event"), and the ER shall be recalibrated in the following manner:
  - The Boundaries of Effective Ratio shall be rounded up or down to the nearest +/- 0.1 increment.
  - If ER > 1+ UB, the new Effective Ratio shall be equal to the UB.
  - If ER < 1+ LB, the new Effective Ratio shall be equal to the LB.
  - If ER ≤ 1+ UB and ER ≥ 1+ LB, there is no Recalibration Event.
- Annually, the Corporation shall determine the upper limit (UB) and lower limit (LB) parameters in accordance with the following:
  - At the time of the calculation, the UB and LB are determined by taking respectively the highest and lowest Daily Ratios over the prior calendar year, in accordance with the following formulas:

$$Lower\ Limit\ (LB) = \min\left({}^{Total\ CF_t}/_{Total\ Base\ IM_t}\right)$$

$$Upper\ Limit\ (UB) = \max\left({}^{Total\ CF_t}/_{Total\ Base\ IM_t}\right)$$

Where :

- $Total\ CF_t$: total amount of Clearing Fund Requirements on the Business Day t.
- $Total\ Base\ IM_t$: the aggregate amount of the Base Initial Margin requirements of all Clearing Members (other than Limited Clearing Members) on the Business Day.
- Min: lowest value from the set of Daily Ratios calculated for each Business Day t in the prior calendar year.

- Max: highest value from the set of Daily Ratios calculated for each Business Day t in the prior calendar year.

- Following a Risk Model Change, the Corporation shall determine the upper limit (UB) and lower limit (LB) parameters in accordance with the following:
  - At the time of the calculation, the UB and LB are determined by taking respectively the highest and lowest Daily Ratios, by calculating the Daily Ratio over the prior 12 month-period with the use of simulated impacts to Base Initial Margin and Clearing Fund as they would have been observed had the Risk Model Change already been in place:

$$Lower\ Limit\ (LB) = min\left({^{Total\ CF_t}}/{_{Total\ Base\ IM_t}} \right)$$

$$Upper\ Limit\ (UB) = \max\left({^{Total\ CF_t}}/{_{Total\ Base\ IM_t}} \right)$$

Where :

- $Total\ CF_t$: total amount of Clearing Fund Requirements on the Business Day t.
- $Total\ Base\ IM_t$: the aggregate amount of the Base Initial Margin requirements of all Clearing Members (other than Limited Clearing Members) on the Business Day t.
- Min: lowest value from the set of Daily Ratios calculated for each Business Day t in the prior 12-month period.
- Max: highest value from the set of Daily Ratios calculated for each Business Day t in the prior 12-month period.
- For greater certainty, for the purposes of the calculating a Daily Ratio, the term "Base Initial Margin" excludes any Additional Margins.

6.3.2 Recalibration Governance

- On a quarterly basis, CDCC will report to Risk Management Advisory Committee (RMAC) for information purposes the Boundaries calculated over the preceding quarter.
- On an annual basis, CDCC will report to RMAC the final Boundaries applicable over the preceding calendar year.
- Following a Risk Model Change CDCC will promptly report to RMAC on the impact of the Risk Model Change on the Boundaries, including whether it leads

to a Recalibration Event, and review the Risk Model Change in accordance with the RMAC standard governance process.

- Annually, or subsequent to any Risk Model Change, each Limited Clearing Member will be notified in writing of the new ER, where applicable.

6.3.3 Entry in force

- Annually, or as soon as practicable upon the occurrence of a Recalibration Event subsequent to a Risk Model Change, the Corporation shall notify in writing each Limited Clearing Member of the new ER applicable to it.
- Subject to Section 6.2.4 below, new ERs shall become effective one calendar quarter after the date of the notification to each Limited Clearing Member of the new ER, and shall remain in force until a revised ER notified to the Limited Clearing Member either as a result of the ER annual review or subsequent to a Risk Model Change enters into force, in accordance with this section.

6.3.4 Recalibration Additional Information

- If the Corporation notifies an Limited Clearing Member of the new ER applicable to it, the Corporation shall provide the Limited Clearing Member with the data supporting the determination that a Recalibration Event has occurred.
- Within 10 Business Days of receiving notice of the new ER applicable to it, a Limited Clearing Member may request additional information regarding the Recalibration.
- Upon receiving such request and in any event, within 5 Business Days following such request, the Corporation will provide additional information respecting the Recalibration Event.
- A Limited Clearing Member may dispute a Recalibration Event by notifying the Corporation that it requires it to be discussed at the next following quarterly RMAC meeting.
- If a Limited Clearing Member has notified the Corporation and RMAC that it disputes a Recalibration Event and the Recalibration Event has been discussed at the subsequent quarterly RMAC meeting, unless a revision of the ER has been agreed, the new ER shall become effective one calendar quarter after the date of the initial notification by the Corporation of the revised ER to the Limited Clearing Member.

6.4 OTCI SECURITIES OPTIONS

In order to evaluate the OTCI Option Price, the implied volatility of the contract must be derived. Two different methodologies are used depending on whether the Option is listed on an Exchange or not.

If the Option is exchange-traded, the Corporation uses the Option's data (the entire Option series for one expiry month) and builds a volatility curve using a cubic spline function. After building the volatility curve, the Corporation determines the implied volatility that corresponds exactly to the strike price of the Option to be assessed. If the expiry date of the Option does not correspond to the ones of the listed series, the Corporation builds two volatility curves, one using the Option series with an expiry date that is right after the one of the assessed Option and one using the series of Options with an expiry date that is right before the one of the assessed Option.

Then, the implied volatility that corresponds to the strike price of the Option to be assessed is determined on each curve. Finally, a linear interpolation is done to determine the implied volatility that corresponds to the strike and to the expiry date of the Option to be assessed. However, if the expiry date of the Option to be assessed is before (after) the first (last) expiry date of the listed Options series, the Corporation uses the volatilities of the volatility curve of the first (last) expiry date of the listed Option series.

If the Option is not listed and no data is available for it, the Corporation uses the yearly historical volatility of the Option's Underlying Interest price as a proxy for the implied volatility.

6.5 MARGIN INTERVAL

The MI is calculated using the following formula:

$$MI = \alpha \times \sqrt{n} \times \sigma$$

Where 'n' is the MPOR, $'\alpha'$ is equal to the confidence level equivalent to 99.87% (three standard deviations) of the cumulative normal distribution (applicable to all products except for the BAX Futures) or equal to the confidence value equivalent to 99% of the cumulative student's t-distribution with 4 degrees of freedom (applicable to the BAX Futures). 'σ' is the volatility estimator of the contract's returns and is computed using an exponentially weighted moving average (EWMA) approach.

The implemented formula for the estimator at any time t is:

$$Intra - Commodity = \alpha \times \sqrt{n} \times \sigma$$

$$\sigma_t = \sqrt{\frac{(1-\lambda)\sum_{i=1}^{260}\lambda^{i-1}(R_{t-i}-\bar{R})^2}{(1-\lambda^{260})}}$$

Where R is the daily price returns of the Underlying Interests for Options and Share Futures and the daily price returns of the Futures prices for Futures (excluding Share Futures), $\overline{R}$ is the mean return over the specified period and λ is the decay factor. CDCC uses λ = 0.99.

In addition, CDCC considers a floor for the EWMA volatility estimator defined above. The level of such floor is calculated as an average of daily EWMA volatility estimator observed over the last 10 years. The volatility estimator that will be used to calculate the MI cannot be lower than the calculated floor.

CANADIAN DERIVATIVES CLEARING CORPORATION
CORPORATION CANADIENNE DE COMPENSATION DE PRODUITS DÉRIVÉS

OPERATIONS MANUAL

~~**OCTOBER 5, 2018**~~

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PREAMBLE AND DEFINITIONS

PREAMBLE

This Amended and Restated Operations Manual cancels and supersedes the previous versions thereof.

CDCC and its Clearing Members are contractually bound by the Membership Agreement which is constituted by the Application for Membership when accepted by CDCC, as may be amended from time to time, which incorporates by reference the Rules of CDCC, as may be amended from time to time. The Rules of CDCC include this Operations Manual, as may be amended from time to time. In the case of conflict, the provisions of the Rules (excluding the Operations Manual) prevail over this Operations Manual. The provisions of the Rules (including this Operations Manual), in the case of conflict, prevail over the provisions of the Application for Membership.

The Operations Manual provides practical details with respect to (i) certain definitions, (ii) timelines, (iii) reports, (iv) trade processing, (v) open positions, (vi) exercises, tenders, assignments and delivery, (vii) settlement, (viii) additional margin processing, and (ix) clearing fees. The Operations Manual contains two schedules which are integral parts thereof: (a) the Risk Manual providing practical details with respect to margin and other risk management processes, including the Default Manual as an Appendix, and (b) the templates of depository agreements.

All times specified in this Operations Manual refer to Eastern Time, unless otherwise indicated.

All amounts specified in this Operations Manual refer to Canadian currency, unless otherwise indicated.

All capitalized terms used in this Operations Manual shall have the meanings assigned to them in the Rules unless the context otherwise requires or unless specifically defined differently herein.

DEFINITIONS

"Automatic Exercise" – a process by which CDCS will exercise In-the-Money Options at a pre-determined threshold.

"**CDCC Clearing Application**" – CDCS and all the processes associated with it, as may be supplemented or otherwise changed from time to time.

"Closing Transaction" – any Transaction that is either a Closing Buy Transaction, a Closing Purchase Transaction, a Closing Sell Transaction or a Closing Writing Transaction, as such terms are defined in the Rules, and in all cases that reduces or eliminates the Clearing Member's Open Interest.

"*Converge*" – marketing brand of the portion of the CDCC Clearing Application that captures and processes OTCI Transactions, including Fixed Income Transactions.

~~**"Difference Fund Account"** – the CDCS record provided to each Clearing Member containing any Additional Margin deposited by such Clearing Member to the CDCC, in respect of any of the following: (1) Unsettled Item, (2) Additional Capital Margin, (3) Advance Calls for Settlement of Losses , (4) OTCI Additional Margin, (5) Discretionary Margin, (6) Additional Margin for Intra-Day Variation Margin Risk, (7) Additional Margin for Mismatched Settlement Risk, (8) Additional Margin for Uncovered Risk of LCMs, and (9), Additional Margin for Variation Margin Delivery Risk; the whole in accordance with the Risk Manual or otherwise as set forth in Section 8-4 hereof.~~

"Eligible Collateral" – collateral which may be deposited with the Corporation for the purpose of fulfilling Margin requirements and which meets certain criteria described in the Risk Manual.

"Exerciser" – a Clearing Member that holds a Long Position in a particular Series of Options and submits an Exercise Notice to CDCC.

PREAMBLE AND DEFINITIONS

"Expiry Friday" – the third Friday of the month, unless that Friday is not a Business Day, then the Business Day preceding the third Friday of the month.

"FIFO Period" – the quarterly delivery period for Futures contracts on Government of Canada bonds, in accordance with Contract Specifications of the relevant Exchange.

"Forward Repurchase Transaction" – a Repurchase Transaction in respect of which the Open Leg has not settled yet at the time of the relevant report.

"FTP Downloads" – Clearing Member's access to files and reports on an FTP server that is part of the CDCC Clearing Application.

"Inquiry Screen" – Graphical User Interface (GUI) view of the CDCC Clearing Application.

"Large Value Transfer System" or "LVTS" – an electronic wire system introduced by the Canadian Payments Association in February 1999 to facilitate the transfer of irrevocable payments in Canadian dollars across the country.

"Limited Clearing Member (LCM)" – has the meaning given thereto in Section A-102 of the Rules.

"Margin Fund Account" – the CDCS record provided to each Clearing Member containing all Margin deposited by such Clearing Member to CDCC, in respect of any of the following: (1) Base Initial Margin (or Adjusted Base Initial Margin, as the case may be~~),~~), (2) Additional Margin for ~~Concentration~~Market Liquidity Risk, (3) Additional Margin for Specific Wrong-Way Risk, (4) Additional Margin for Mismatched Settlement Risk, (5) Additional Margin for Intra-Day Variation Margin Risk, (6) Additional Margin for Unpaid Option Premium Exposure Risk, (7) Additional Margin for Banking Holiday Risk, (8) Additional Margin for Variation Margin Delivery Risk, (9) Additional Capital Margin Risk, (10) Additional Margin for Uncovered Risk of Limited Clearing Members, , (11) Variation Margin for Options, and (~~5~~12) Variation Margin for Unsettled Item; the whole in accordance with the Risk Manual, or otherwise as set forth in Section 8-1 hereof.

"Mini Futures Contract" – a Future that has the same Underlying Interest as a Standard Futures Contract but having a Unit of Trading that is a ratio of the Standard Futures Contract in accordance with applicable Contract Specifications.

"Net Settlement Position" – all the future Net Delivery Requirements and Net Payment Against Delivery Requirements of a Clearing Member, as reported by CDCC on a daily basis, taking into account all Fixed Income Transactions that have settled during the day and all new Fixed Income Transactions that have been novated to CDCC.

"Net Variation Margin Requirement" – has the meaning given thereto in Section D-601 of the Rules. Reference will be made to (Fixed Income) Net Variation Margin Requirement in this Manual.

"Open Position File" – database of the CDCC Clearing Application which compiles the Open Positions of all Clearing Members. Each Clearing Member can access the information pertaining to his accounts only, not to other Clearing Members' accounts.

"Opening Transaction" – any Transaction that is either an Opening Buy Transaction, an Opening Purchase Transaction, an Opening Sell Transaction or an Opening Writing Transaction as set forth in Section A-102 of the Rules.

"Operational Notices" – formal notifications to the Clearing Members, representing items that are not published on CDCC's website. These documents are available on the Secured Website.

PREAMBLE AND DEFINITIONS

"OTCI Equity Options" – over the counter options on an equity, bearing characteristics that differ from Exchange traded Options and are cleared by CDCC through *Converge.*

"Position Transfer" – this is the CDCC Clearing Application function to move a position from one Clearing Member to another.

"Production Schedule" – all of the time lines that are followed by CDCC, as set forth in Section 2 of this Operations Manual.

"Request for Standard vs Mini Offset" – the request by a Clearing Member, in the form prescribed by CDCC, to offset one (1) or more Long Position(s) on a Standard Futures Contract against the equivalent number of Short Positions on the corresponding Mini Futures Contract (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract), having the same Delivery Month and booked in the same Clearing Member's account, or the other way around.

"Running Repurchase Transaction" – a Repurchase Transaction in respect of which the Open Leg has already settled at the time of the relevant report.

"Secured Website" – Clearing Members only secured web site that requires a sign on and password, where CDCC publishes Operational Notices as well as documents that are meant only for the Clearing Members.

"Specific Deposit" – a Put Escrow Receipt, a Call Underlying Interest Deposit or a Futures Underlying Interest Deposit which are accepted by CDCC as Underlying Interest Equivalent to cover a specific Short Position.

"Standard Futures Contract" – a Future in relation to which a Mini Futures Contract exists.

"Tenderer" – a Clearing Member that holds a Short Position in a particular Series of Futures and submits a Tender Notice, or is deemed to do so in accordance with the Rules, to CDCC.

"**Unsettled Item**" – any delivery of the Underlying Interest that has not been settled at the Central Securities Depository.

"(Fixed Income) Variation Margin Account" – the CDCS record provided to each Clearing Member containing all Margin deposits made by such Clearing Member to CDCC for (Fixed Income) Net Variation Margin Requirement purposes only, in accordance with Section D-607 of the Rules, or otherwise as set forth in Section 8-1 hereof.

"**Weekly Options**" – Options that expire on any Friday, other than Expiry Friday. Only monthly Options expire on Expiry Friday.

TIME FRAMES

ON-LINE ACCESS

Each Clearing Member must be connected to the CDCC Clearing Application using its PC terminals to perform a variety of functions. (Clearing Members must supply their own PC terminals and Internet connection, at their own cost).

All instructions (corrections, Open Position changes, Position Transfers, Deposits, withdrawals, and submission of Exercise Notices and Tender Notices) must be entered on-line.

The CDCC Clearing Application allows Clearing Members to view their current information throughout the day electronically (except during scheduled maintenance or unforeseen outages). In addition, Clearing Members can download their reports after 7:00 p.m. every day using the FTP Download function.

Should a Clearing Member not have electronic access (due to technical issues) to the CDCC Clearing Application during Office Hours, CDCC can perform instructions on behalf of the Clearing Member. This requires a phone call from the Clearing Member to CDCC, along with the appropriate form faxed or scanned and e-mailed to CDCC. Such form must be authorized with the approved Clearing Member's stamp.

With respect to operational activity related to Options with an Expiration Date on Expiry Friday, CDCC staff members are on-site from 7:00 a.m. to forty-five (45) minutes after delivery of the Options Exercised and Assigned Report (MT02).

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TIME FRAMES

SETTLEMENT TIME FOR EVERY BUSINESS DAY

Activity	Time Frames	Activity Type
Start of Settlement Day at CDS and Clearing Day at CDCC	5:30 a.m.	System Activity
Clearing Member's (excluding LCMs) Early Morning Intra-Day Margin Calculation & Notification	7:15 a.m.	System Activity/Notification
Deadline to settle Early Morning Intra-Day Margin Call for Clearing Members (excluding LCMs)	1 hour after notification	Obligation Deadline
Assets Concentration Limits breach notification	7:30 a.m.	Notification
Deadline for Clearing Members (excluding LCMs) for Settlement Time with respect to payments for overnight settlement	7:45 a.m.	Obligation Deadline
Fixed Income Transactions – Netting Cycle Timeframe in respect of any Pending Settlement Requirements – 15 minutes cycle	8:30 a.m.	System Activity
Deadline for Clearing Members (excluding LCMs) to receive EOD Amount due from CDCC	8:45 a.m.	Obligation Deadline
Deadline for LCMs for Settlement Time with respect to payments for overnight settlement	9:00 a.m.	Obligation Deadline
~~Additional Capital Margin: Notification to Clearing Members (excluding LCMs)~~	~~9:30 a.m.~~	~~Publication~~
Fixed Income Transactions – Morning Netting Cycle Timeframe in respect of any Pending Payment Against Delivery Requirements (Morning Net Payment Against Delivery Requirements sent to CDS for settlement during the Morning Net DVP Settlement Timeframe) – 15 minutes cycle	10:00 a.m.	System Activity
Morning Net DVP Settlement Calculation	10:15 a.m.	System Activity
Deadline for Morning Net DVP Settlement	10:30 a.m.	Obligation Deadline
Clearing Member's (excluding LCMs) Morning Intra-Day Margin Calculation & Notification	10:30 a.m.	System Activity/Notification
Deadline to settle Morning Intra-Day Margin Call for Clearing Members (excluding LCMs)	1 hour after notification	Obligation Deadline
Assets Concentration Limit breach correction deadline	11:45 a.m.	Obligation Deadline

TIME FRAMES

~~Additional Capital Margin: Obligation to meet the Capital Requirement~~	~~12:00 p.m.~~	~~Obligation Deadline~~

SETTLEMENT TIME FOR EVERY BUSINESS DAY (continued)

Activity	**Time Frames**	**Activity Type**
Fixed Income Transactions – Netting Cycle Timeframe in respect of any Pending Settlement Requirements – 15 minutes cycle	12:15 p.m.	System Activity
Clearing Member's Afternoon Intra-Day Margin Calculation & ~~Clearing Members (excluding LCMs) notification~~Notification	12:45 p.m.	System Activity/Notification
Deadline to settle Afternoon Intra-Day Margin Call for Clearing Members (excluding LCMs)	1 hour after notification	Obligation Deadline
Specific Deposits (same day withdrawal)	12:45 p.m.	Operational Deadline
~~Additional Margin Call for Mismatched Settlement Risk~~	~~1:30 p.m.~~	~~Publication~~
~~Additional Margin Call for Intra-Day Variation Margin Risk~~	~~1:30 p.m.~~	~~Publication~~
~~Additional Margin Call for Variation Margin Delivery Risk~~	~~1:30 p.m.~~	~~Publication~~
~~Additional Margin Call for Uncovered Risk for LCMs~~	~~1:30 p.m.~~	~~Publication~~
~~LCM Intra-Day Margin Call and Additional Margins Notification~~	~~1:30 p.m.~~	~~Notification~~
~~Clearing Members (excluding LCMs) Additional Margins Notification~~	~~1:30 p.m.~~	~~Notification~~
~~Deadline to settle Additional Margins for Clearing Members (excluding LCMs)~~	~~1 hour after notification~~	~~Obligation Deadline~~
Deadline to settle Intra-Day Margin Call and Additional Margins for LCMs	The later of ~~3:30~~2:45 p.m. or 2 hours after notification	Obligation Deadline
Fixed Income Transactions – Netting Cycle Timeframe in respect of any Pending Settlement Requirements – 15 minutes cycle	2:00 p.m.	System Activity

TIME FRAMES

Cash Deposits (Margin deposits) – $10,000,000 and under (same day deposit)	2:45 p.m.	Operational Deadline
Cash Deposits (Margin deposits) – over $10,000,000 (2 Business Days notice)	2:45 p.m.	Operational Deadline

SETTLEMENT TIME FOR EVERY BUSINESS DAY (continued)

Activity	**Time Frames**	**Activity Type**
Cash withdrawal requests (Margin deposits) – $10,000,000 and under (same day withdrawal)	2:45 p.m.	Operational Deadline
Cash withdrawal requests (Margin deposits) – over $10,000,000 (2 Business Days notice)	2:45 p.m.	Operational Deadline
Fixed Income Transactions – (Same Day Transactions) – Submission Cut-Off Time	3:30 p.m.	Operational Deadline
Clearing Members (excluding LCMs) - All assets deposits other than cash (Margin deposits)	3:30 p.m.	Operational Deadline
Clearing Members - All assets withdrawal requests other than cash (Margin deposits) for same day withdrawal	3:30 p.m.	Operational Deadline
Clearing Members - All assets substitution requests other than cash (Margin deposits) for same day substitution	3:30 p.m.	Operational Deadline
Fixed Income Transactions – Afternoon Netting Cycle Timeframe in respect of any Pending Settlement Requirements (Afternoon Net DVP Settlement Requirements sent to CDS for settlement by End of Day DVP Settlement Time) – 5 minutes cycle	3:35 p.m.	System Activity
CDS Payment Exchange, Net Wire Payment	4:00 p.m.	System Activity
End of Day DVP Settlement Time	4:00 p.m.	Obligation Deadline
Unsettled Item (Options Underlying deliveries only): Confirmation of settled items to be sent to CDCC	4:15 p.m.	Operational Deadline
Deadline for CDCC to respond to substitution or withdrawal request (other than (Fixed Income) Variation Margin)	4:30 p.m.	Obligation Deadline
OTCI (other than Fixed Income Transactions) – Trade Submission Deadline	4:30 p.m.	Operational Deadline
Projected Margin Report Computation	4:30 p.m.	System Activity

Futures – Request for Standard vs Mini Offset	5:00 p.m.	Operational Deadline
Position Transfers	5:25 p.m.	Operational Deadline
Same Day and T+1 Trade corrections	5:30 p.m.	Operational Deadline

SETTLEMENT TIME FOR EVERY BUSINESS DAY (continued)

Activity	Time Frames	Activity Type
Open Position changes	5:30 p.m.	Operational Deadline
Futures – Tender Notices submission	5:30 p.m.	Operational Deadline
Options – Exercise Notices submission	5:30 p.m.	Operational Deadline
Fixed Income Transactions and Futures contracts on Acceptable Securities – Netting Cut Off Time (Netted settlement instructions (Net Delivery Requirements and Net Payment Against Delivery Requirements) sent to CDS for settlement on the next business day)	5:30 p.m.	System Activity
CDCC Clearing Application shutdown – Close of Business	5:30 p.m.	System Activity
FIFO: Daily reporting by Clearing Members of the Long Positions in each of their accounts in chronological order	5:30 p.m.	Operational Deadline
FIFO: Submission of Tender Notices	5:30 p.m.	Operational Deadline
LCM Only - All assets deposits other than cash (in respect of all Margin requirements)	6:30 p.m.	Operational Deadline
Fixed Income Transactions – available (next Business Day start)	7:00 p.m.	System Activity

TIME FRAMES

SETTLEMENT TIME FOR (FIXED INCOME) VARIATION MARGIN FOR EVERY BUSINESS DAY

Activity	Time Frames	Activity Type
Deadline to deliver securities to CDCC to settle Net Variation Margin Requirement	9:30 a.m.	Obligation Deadline
Deadline to submit to CDCC a (Fixed Income) Buy-In request for same day settlement	10:00 a.m.	Operational Deadline
Deadline to deliver securities to Clearing Members by CDCC to settle (Fixed Income) Variation Margin amount	10:30 a.m.	Obligation Deadline
Deadline to submit substitutions for same day settlement	11:00 a.m.	Operation Deadline
Deadline for CDCC to submit substitution instructions to Clearing Members for same day settlement	12:00 (noon)	Operational Deadline
Deadline to deliver same day settlement substitution to CDCC	3:00 p.m.	Obligation Deadline
Deadline for CDCC to deliver same day substitutions For (Fixed Income) Variation Margin	4:00 p.m.	Obligation Deadline
EOD Net Variation Margin Requirement Computation	4:30 p.m.	System Activity

SETTLEMENT TIME FOR MONTHLY EXPIRY

TIME FRAMES

Activity	Time Frames	Activity Type
Reports available (FTP Download): ➢ Expiry Report (MX01) ➢ Expiry Options Daily Transaction Report (MT01) ➢ List of Options/Cash Adjustments (MT03)	7:15 p.m.	Publication
CDCC Clearing Application available for: ➢ Trade corrections ➢ Open Position changes ➢ Position Transfers ➢ Changes to Automatic Exercises ➢ Exercise Notices input ➢ Cancel / correct Friday's exercises	7:15 to 10:15 p.m.	Operational Deadline
CDCC Clearing Application shutdown: ➢ CDCC processes expiry entries	10:15 p.m.	Operational Deadline
Reports available (FTP Download): ➢ List of Expiry Adjustments Report (MX02) ➢ Expiry Difference Report (MX03)	10:30 p.m.	Publication
CDCC Clearing Application available again for: ➢ Review of expiry entries ➢ Corrections to expiry entries	10:30 to 10:45 p.m.	Operational Deadline
CDCC Clearing Application shutdown ➢ Close of Business	10:45 p.m.	Operational Deadline
Reports available (FTP Download): ➢ Options Exercised and Assigned Report (MT02) ➢ Other reports and files also available	12:30 a.m.	Publication

TIME FRAMES

SETTLEMENT TIME FOR WEEKLY EXPIRY

Activity	Time Frames	Activity Type
CDCC Clearing Application available for: ➢ Trade corrections ➢ Open Position changes ➢ Position Transfers ➢ Changes to Automatic Exercises	7:00 to 8:00 p.m.	Operational Deadline
CDCC Clearing Application shutdown: ➢ Close of Business	8:00 p.m.	Operational Deadline
Reports available (FTP Download): ➢ Options Exercised and Assigned Report (MT02) ➢ Other reports and files also available	9:45 p.m.	Operational Deadline

TIME FRAMES

ADDITIONAL NET DVP SETTLEMENT PROCESS

In respect of any Pending Payment Against Delivery Requirements at the Netting Cycle Timeframe(s) specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Net Payment Against Delivery Requirements) to the Central Securities Depository reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member.

CDCC-REPORTS

REPORT REFERENCES

Clearing Member reports contain the following information:

Transactions	Reports relating to Clearing Member's Transactions such as trade entries, trade corrections, trade rejections and exercises/tenders. These reports start with the alpha code MT.
Fees	Report relating to the collection of service fees from the Clearing Member. These reports start with the alpha code MB.
Settlements	Reports relating to Premiums, Settlement of Gains and Losses, and Margin. These reports start with the alpha code MS.
Assets	Reports relating to the maintenance of Clearing Member's assets as well as depository information. These reports start with the alpha code MA.
Delivery	Reports relating to delivery obligations and unsettled deliveries. These reports start with the alpha code MD.
Positions	Reports relating to positions held by Clearing Members separately for Futures, Options, OTCI and Fixed Income Transactions. These reports start with the alpha code MP.
Expiry	Reports used by Clearing Members to verify expiring positions and automatic exercises. These reports start with the alpha code MX.
Risk	Reports relating to risk management. These reports start with the alpha code MR.

CDCC-REPORTS

REPORT DETAILS

Report Code	Report Name	Report Description
Daily:		
MA01	Deposits and Withdrawals Report	Details on Clearing Member's deposits and withdrawals for Margin Fund Account, Clearing Fund~~, Difference Fund Account~~ and (Fixed Income) Variation Margin Account. (**Note**: will find the letters D, W and PW next to the date of deposit)
MD01	Options Unsettled Delivery Report	Lists unsettled deliveries for Options.
MD51	Futures Unsettled Delivery Report	Lists unsettled deliveries for Futures (does not include Share Futures) - the issue and number of Futures contracts which must be delivered - the account to which the delivery has been assigned and the opposite Clearing Member - the Settlement Amount and settlement date
MD52	Share Futures Unsettled Delivery Report	Lists unsettled deliveries for Share Futures (SF) - the issue and number of SF contracts which must be delivered - the account to which the delivery has been assigned and the opposite Clearing Member - the Settlement Amount and settlement date
MD70	Fixed Income Net Settlement Delivery Status Report	Status of Clearing Member's settlement activity at the Central Securities Depository with respect to Acceptable Securities on that day.
MD71	Settlement Obligation Calculated Amounts Reports	Provide information on each Settlement Instruction produced at the exit of the Intra-Day netting that is being considered in the PITSO.
MD72	Settlement Obligation Fulfillment	Provide the different settlement instruction status changes during the PITSO. The report is separated in three sections: Settlement, Pending Party At Fault and Cancelled.
MP01	Options Open Positions Report	Lists the Clearing Member's Open Positions for puts and calls.
MP02	Sub-Account Options Open Positions Report	Lists all Options Open Positions in sub-accounts of the Clearing Member's Client Account(s), Firm Account(s) and Multi-Purpose Account(s).
MP21	Contract Adjustment Report	Lists the Clearing Member's Long Positions and Short Positions before and after the relevant contract adjustment.
MP51	Futures Open Positions Report	Lists the Clearing Member's Futures and Options on Futures Open Positions for all accounts.
MP70	Fixed Income Forward Repo Position Report	Lists the Clearing Member's Repurchase Transactions accepted for clearing by CDCC.
MP71	Fixed Income Repo Conversion Position Report	Lists all of the Clearing Member's Repurchase Transactions that have progressed from Forward Repurchase Transactions to Running Repurchase Transactions on that day.
MP73	Fixed Income Running Repo Open Positions Report	Lists all of the Clearing Member's Running Repurchase Transactions as of that day.
MP75	Fixed Income Forward Net Settlement Positions Report	Lists all of the Clearing Member's forward Net Settlement Positions obligations.
MP79	Daily Repo Rate Mark to Market Report	Lists the Clearing Member's Repo Rate Requirements,
~~MR05~~	~~*OTCI (Converge)* Position Limits Usage Report~~	~~Lists Clearing Member's percentage of OTCI (*Converge*) Position Limits used.~~

CDCC-REPORTS

~~MR50~~	~~Daily Capital Margin Monitoring Report~~	~~Lists Clearing Member's (excluding LCM) Margin and capital requirements.~~ ~~Identifies if additional Margin is required.~~
MS01	Daily Settlement Summary Report	Lists assets balances with Margin requirements and cash settlement in Canadian and U.S. dollars.
~~MS03~~MS06	~~Trading and~~Total Margin ~~Summary~~Requirement Report	~~Lists Options Premiums, Settlement of Gains and Losses, Futures Premiums and Margin requirements for each sub-account.~~ ~~**Note**: Does not include trade adjustments (T+1)~~Total margin requirement report with breakdown by margin categories, account types (Firm, Client, Multipurpose) and sub-accounts
~~MS05~~	~~SPAN Performance Bond Summary Report~~	~~The report shows the Performance Bond (Margin) requirements for each Clearing Member by type of account.~~
MS07	Intra-Day Margin Report	Margin call details with Margin requirements by account.
MS08	Daily Margin Activity Report	Lists details of positions by Class Group with Margin requirements.
MS10	Variation Margin Summary Report	Lists the details of the Fixed Income Clearing Member's Variation Margin activities and suggests securities to return if applicable.
MS70	Fixed Income Net Settlement Position Activity Report	Lists all of the Clearing Member's Fixed Income Transactions activities that contribute to its Net Settlement Position.
MS73	Entitlement Report	Lists all Fixed Income Clearing Member's coupon payments.
MS75	Fixed Income End of Day Settlement Instruction Report	Detail of Clearing Member's net settlement instructions to be sent to the Central Securities Depository after Netting Cut-Off Time.
MS77	Net Payment Against Delivery Requirement	Provide information at the sub-account level on settlements that occurred during the PITSO.
MS78	Forward NSP & Settlement Instruction Reconciliation Report	Information report containing Net Settlement Position information for the use of Clearing Member for reconciliation.
MT01	Options Daily Transaction Report	Lists details for all Option contracts from previous Business Day.
MT02	Options Exercised and Assigned Report	Lists totals for Options Exercised Positions and Assigned Positions by Series of Options (including the debit and credit dollar values of the Transactions).
MT03	List of Options/Cash Adjustments Report	Lists all trade adjustments and Open Position changes including cash adjustments and Position Transfers.
MT05	Options Consolidated Activity Report	Lists all positions with activity including Option Premiums.
MT06	Options Sub-Account Consolidated Activity Report	Lists positions with activity including Option Premiums for only the sub-accounts of Client, Firm and Multi-Purpose.
MT10	Unconfirmed Items Report	Lists all items that remained unconfirmed by the opposite member at the end of the current Business Day.
MT29	Trades Rejection Modification Report	Lists all original and modified trade rejections for the Clearing Member.
MT51	Final Futures Daily Transaction Report	Lists trade details for all Futures and Options on Futures activity.
MT52	Futures Tenders and Assignments Report	Lists all Tender Notices and Assigned Positions details.

CDCC-REPORTS

MT53	List of Futures/Cash Adjustments Report	Lists details on all Futures and Options on Futures trade adjustments, Open Position changes, including cash adjustments and Position Transfers.
MT54	Futures Trading Summary Report	Lists all Series of Futures and Options on Futures and prices, and volumes at which each were traded. Lists number of contracts bought and sold for each Series of Futures Trade Prices.
MT60	Share Futures Tender and Assigned Report	Lists totals for Share Futures (SF) tendered and assigned positions including the debit and credit dollar values of the transactions.
MT66	Futures Sub-Account Consolidated Activity Report	Lists Futures and Options on Futures positions with activity including Settlement of Gain and Losses and Futures Premiums respectively, for the sub-accounts of Client, Firm and Multi-Purpose.
MT70	Fixed Income Novated Transactions Report	Lists the Clearing Member's daily Fixed Income Transactions novated to CDCC in accordance with the CDCC Clearing Application.
MT71	Fixed Income CSD Novated Trades Report	Lists the data transmitted to CDCC by the Central Securities Depository with respect to the Clearing Member's daily Fixed Income Transactions submitted for clearing.
MT73	Fixed Income Trade Rejection Report	Lists details of Clearing Member's daily Fixed Income Transactions that were rejected (DK) by CDCC or by the Clearing Member itself.
MT74	Fixed Income Not-Novated Transactions Report	Lists the Clearing Member's daily Fixed Income Transactions that were not novated to CDCC, including all rejected and orphaned trades.
MT92	Options on Futures Exercised & Assigned Report	Lists totals for Options on Futures Exercised Positions and Assigned Positions by Series. **Note**: Futures Options Exercised Positions and Assigned Positions value is nil
MT99	Detailed Futures Consolidated Activity Report	Detailed list of all Futures position with activity, including Settlement of Gains and Losses. Detailed list of all Options on Futures positions and activity including Futures Premiums.
Monthly:		
MA71	Clearing Fund Statement (monthly and intra-monthly)	Identifies the Clearing Member's (excluding LCM) Clearing Fund obligation. Lists the Clearing Member's (excluding LCM) current Deposits within the Clearing Fund and what is owed.
MB01	Monthly Clearing Fees Invoice	This report contains summarization of the monthly clearing fees in an invoice format – THIS IS NOT TO BE PAID. The system automatically includes the collection of the fees within the daily settlement on the morning of the fifth business day of the month.
MB02	Monthly Clearing Fees Details Report	This report contains the following four sub-reports: ''Fees'' – this is product by sub-account. ''Summary by Category'' – this is summarization by product. "Sub-Account Summary" – this is a summary of the operational charges by sub-account irrespective of product. ''Summary by Account Operation Type'' – this is a summary of the operational charges by sub-account.
MB03	Monthly Fixed Income Clearing Fees Invoice	This report details the clearing fees that are due with respect to Fixed Income Transactions by each Clearing Member.
MT40	Broker Ranking by Account Report	Individual Clearing Member ranking within CDCC for contracts, value traded and transactions (trade only) by month with year to date.
FIFO Period:		
MP56	FIFO Position Report	Lists Series of Futures with positions in chronological order, contracts in positions.

CDCC-REPORTS

MP60	FIFO Declaration vs. Open Position Report	Lists Clearing Member's Futures positions and FIFO long positions declaration.
Options on Futures Expiry:		
MT51	Final Futures Daily Transaction Report	Lists trade details for all Futures and Options on Futures activity.
MX11	Futures Options Expiry Report	Lists all expiring Options on Futures with In-the-Money Options or Out-Of-the-Money Options amounts and Automatic Exercise positions for Expiry.
MX12	Futures Options Expiry Adjustments Report	Lists all trade adjustments and Open Positions changes on expiring Series only.
MX13	Futures Options Expiry Difference Report	Lists all reported changes, deletions and/or additions to exercises on the Futures Options Expiry Report (MX11).
Options Expiry (Friday Evening):		
MT01	Options Daily Transaction Report	Lists trade details for all expiring Option contracts for the Business Day.
MT02	Options Exercised and Assigned Report	Lists totals for Options Exercised Positions and Assigned Positions by Series of Options (including the debit and credit dollar values of the transactions).
MX01	Expiry Report	Lists all expiring Options with In-the-Money Options or Out-of-the-Money Options amounts and Automatic Exercise positions for Expiry.
MX02	List of Expiry Adjustments Report	Lists all trade adjustments and Open Positions changes on expiring Series of Options only.
MX03	Expiry Difference Report	Lists all reported changes, deletions and/or additions to exercises on the Expiry Report.
OTCI Expiry:		
MX01	Expiry Report	Lists all expiring Options with In-the-Money Options or Out-of-the-Money Options amounts and Automatic Exercise positions for Expiry.
Business Day following Expiry:		
MP11	Expired Options Positions Report	Lists the Clearing Member's balance of expired Options positions following the Friday Expiry process.
MP12	Expired Futures Options Positions Report	Lists the Clearing Member's balance of expired Futures Options positions following the Friday Expiry process.

TRADE PROCESSING

INTRODUCTION

All Exchange Transactions are processed electronically. In all cases both the selling and buying trade data is sent to the relevant Exchange's electronic trading system, which then transmits the matched trades to CDCC. The CDCC Clearing Application verifies the trade information and, if incorrect, rejects it for correction and resubmission. If the trade information is valid, the Clearing Member's Open Positions are immediately updated. The Exchange Transaction is reported on the Options Daily Transaction Report (MT01) or on the Final Futures Daily Transaction Report (MT51), as the case may be.

OTCI Transactions (other than Fixed Income Transactions) are also submitted electronically. Clearing Members submit their individual trade details onto the trade capture screens of Converge, which will match, validate and confirm the transactional details to the submitting Clearing Members. OTCI Options are reported on the Options Daily Transaction Report (MT01). No corrections will be permitted for OTCI Transactions after CDCC issues a Trade Confirmation.

Fixed Income Transactions will be transmitted through the CDS trade matching facility routing matched trades to CDCC.

Fixed Income Transactions are reported on the Fixed Income CSD Information Report (MT71).

The reports referred to herein are available for FTP Downloads on the morning of the Business Day after Transactions are submitted for clearing to CDCC. In accordance with the Rules, Clearing Members must verify that such reports are correct.

TRADE PROCESSING

EXCHANGE TRANSACTIONS (OPTIONS AND FUTURES)

Positions of each Clearing Member are carried by CDCC for Client Account(s), Firm Account(s) and Multi-Purpose Account(s), each of which is maintained separately. CDCC supplies reports for each account.

Such separation requires that each Clearing Member designate whether a Transaction is submitted for a "Client", "Firm" or "Multi-Purpose" when submitting a Transaction for clearing. Furthermore, if separate sub-accounts are maintained for each account type, each Transaction must be coded to indicate the appropriate sub-account information.

It is required that a Closing Transaction for a Client Account be designated as such on the trade input. Such designation is not required for a Netted Client Account, a Multi-Purpose Account or a Firm Account, as CDCC carries net position records in the Open Position File for each of these accounts.

All Transactions for a Client Account which are not specifically designated as Closing Transactions shall be processed by CDCC as Opening Transactions. Opening Purchase Transactions increase the Long Position and Opening Writing Transactions increase the Short Position, in the particular Series of Options involved, as reported in the Clearing Member's Client Account. Opening Buy Transactions increase the Long Position and Opening Sell Transactions increase the Short Position, in the particular Series of Futures involved, as reported in the Clearing Member's Client Account.

Conversely, all Transactions designated as Closing Transactions decrease the Short Position and Long Position, respectively, for the particular Series of Options or Series of Futures in the reporting Clearing Member's Client Account. The CDCC Clearing Application verifies that all the Closing Transactions are valid and if the volume of a Closing Transaction exceeds the Open Position, the CDCC Clearing Application will reject it and replace it by an Opening Transaction for the entire volume.

The designation of a Transaction as "opening" or "closing" can be modified by the Close of Business.

CDCC maintains both the Long Position <u>and</u> the Short Position for each Series of Options and Series of Futures for Client Accounts but only maintains a net Long Position <u>or</u> net Short Position for each Series of Options and Series of Futures for Netted Client Accounts, Multi-Purpose Accounts and Firm Accounts.

TRADE PROCESSING

FIXED INCOME TRANSACTIONS

Positions of each Clearing Member are carried by CDCC for Client Account(s), Firm Account(s) and Multi-Purpose Account(s), each of which is maintained separately. CDCC supplies reports for each account.

Such separation requires that each Clearing Member designate whether a Transaction is submitted for a “Client”, “Firm” or “Multi-Purpose” when submitting a Transaction for Clearing. Furthermore, if separate sub-accounts are maintained for each account type, each Transaction must be coded to indicate the appropriate sub-account information.

All Repurchase Transactions and Cash Buy or Sell Trades must be submitted for clearing to CDCC through the CDS trade matching facility routing matched trades to CDCC.

Once a Repurchase Transaction or Cash Buy or Sell Trade is received by CDCC, a variety of validations will occur. These validations ensure that all transactional details match and CDCC does not accept any Repurchase Transaction or Cash Buy or Sell Trade bearing attributes that are not acceptable for clearing.

Upon issuance of a Trade Confirmation by CDCC, the Repurchase Transaction or Cash Buy or Sell Trade is novated to CDCC, such that the original Repo or Cash Buy or Sell Trade between the two Fixed Income Clearing Members is cancelled and replaced by two equivalent Fixed Income Transactions, one between the Seller and CDCC and one between the Buyer and CDCC.

OPEN POSITIONS

INTRODUCTION

Having accepted a Transaction, the next step in the CDCC Clearing Application is the determination of the Open Position. Each Clearing Member can view all the information related to their accounts on the Open Position File which records the open Long Position and Short Position for each Series of Options and Series of Futures, OTCI and Fixed Income Transactions for each account type, updating the information as each Transaction is accepted.

Each Clearing Member is responsible for reconciling the information recorded on the Open Position File and all relevant reports issued by CDCC against their internal records. Careful attention must be paid to account designation and whether the Transaction is coded as “opening” or “closing” in the relevant file or report. Reports are available for FTP Download as per Section 2 of this Operations Manual.

Open Interest is updated automatically as each Transaction, Exercise Notice and Tender Notice is processed.

ADJUSTMENTS OF OPEN POSITIONS

GENERAL

Occasionally the need will arise to adjust an already processed Transaction. In such cases, the adjustment will affect the Clearing Member's Open Position accordingly. For example, an adjustment designed to change the original Opening Buy Transaction (or Opening Purchase Transaction) to a Closing Buy Transaction (or Closing Purchase Transaction) will result in a decrease in the Long Position in the Series of Futures or Series of Options by the volume of the original Transaction. Any Settlement of Gains and Losses (or Premium) adjustments will be shown as adjustments on the relevant report.

Generally this situation will occur when:

1. The transactional details were incorrectly recorded, e.g. Clearing Member number, price, series and volume.

2. Information pertaining to only one side of the Transaction such as the opening/closing or account designation was erroneously reported on the original trade.

3. The source document of the relevant Exchange was input incorrectly.

4. Transfer of Open Positions from one account to another account of a Clearing Member.

5. Transfer of Open Positions from an account of one Clearing Member to an account of another Clearing Member.

Types of Adjustments

The following adjustments are acceptable for Exchange Transactions and OTCI (other than Fixed Income Transactions):

1. Same Day Trade Corrections (T). Same day trade corrections are only permitted on account type, sub-account designation and opening/closing and no corrections are permitted on OTCI Transactions after a Trade Confirmation has been issued by CDCC.

2. Trade Date + 1 Corrections (T+1). Modifications of any type are subject to approval by the relevant Exchange and no corrections permitted on OTCI Transactions.

OPEN POSITIONS

3. Open Position Changes. For OTCI Transactions, these will be performed through the Position Transfer function of the CDCC Clearing Application. Note: there is a Position Transfer fee per contract.

4. Position Transfers. Specific function of the CDCC Clearing Application to move positions from one Clearing Member to another or between accounts of a same Clearing Member on a post trade basis. Note: there is a Position Transfer fee per contract.

5. Standard vs Mini Offset. Upon the receipt of a Request for Standard vs Mini Offset in the prescribed form, CDCC will offset (i) one or more existing Standard Futures Contract Long Position(s) against the equivalent number of existing Mini Futures Contract Short Positions (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract) having the same Delivery Month and booked in the same Clearing Member's account, or (ii) a number of existing Mini Futures Long Positions against one or more Standard Futures Short Position(s) (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract) having the same Delivery Month and booked in the same Clearing Member's account, based on the instructions provided in the Request for Standard s Mini Offset. Such Long Positions and Short Positions shall be offset at the previous day's Settlement Price, with the effect of reducing the Open Positions that the Clearing Member has on the relevant Series of Futures in the relevant account.

Conditions applicable to adjustments:

If there are any adjustments that affect another Clearing Member (on the opposite side of the original Transaction), both Clearing Members must come to an agreement as to the adjustments to be implemented. If one Clearing Member does not enter any changes through the CDCC Clearing Application, the Transaction will stay as is with respect to both Clearing Members.

Notification of all adjustments must be completed prior to the time specified in Section 2 of this Operations Manual. All completed adjustments are processed when they have been verified and validated by CDCC.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

INTRODUCTION

OPTIONS

At the time of exercise of an Option, CDCC is responsible for issuing settlement records that will facilitate the delivery of the Underlying Interest to the Clearing Member who chooses to exercise that Option (in case of the exercise of a call Option) or the payment of the relevant Exercise Price (in the case of the exercise of a put Option). When a Clearing Member exercises an Option, CDCC assigns the delivery obligation to a Clearing Member who is the writer of Options in the same Series of Options in any one of its Client Account(s), Firm Account(s), or Multi-Purpose Account(s).

Assignment is made specifically to one of these accounts by CDCC. If assignment is made to a Client Account, the Clearing Member is responsible for allocating it to a specific client. If assignment is made to a Multi-Purpose Account, the Clearing Member must allocate it to the specific Multi-Purpose Account designated by CDCC.

Delivery of the Underlying Interest and payment of the Exercise Price is to be effected by Clearing Members through the settlement method instructed by CDCC.

FUTURES

All Futures which have not been closed out by the last trading day will be marked-to-market up to and including the close of the last trading day. In addition, the seller of a Future must submit a Tender Notice in the Delivery Month in accordance with applicable Contract Specifications.

When a seller of a Future submits a Tender Notice to CDCC, CDCC assigns it to a Clearing Member which is the buyer of a Future in the same Series of Futures in any one of its accounts. Assignment is made specifically to one of these accounts by CDCC. If assignment is made by CDCC to a Client Account, the Clearing Member is responsible for allocating it to a specific client. If assignment is made to a specific Multi-Purpose Account, the Clearing Member must allocate it to the specific Multi-Purpose Account designated by CDCC.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

EXPIRY PROCEDURES

Operations Notices are sent to Clearing Members setting forth the expiry procedures and it is the responsibility of Clearing Members to ensure that they have adequate processes in place to meet requirements and timelines prescribed by CDCC.

OPTIONS

For all information pertaining to the Option expiry procedures, Clearing Members should refer to the Operational Notices which are issued prior to the Expiration Date.

CDCC's Responsibilities on Expiry Friday

1. Review/modify Underlying Interest prices and notify the Clearing Members of any changes.
2. Notify Clearing Members (via e-mail) of any changes in the Production Schedule.
3. Notify Clearing Members (via e-mail) of the status of expiry processes.
4. Assist Clearing Members.

Clearing Members' Responsibilities on Expiry Friday

1. Ensure that the staff responsible for expiry is familiar with all expiry procedures and processes.
2. Validate entries using the Inquiry Screens or the relevant reports:
    a. Verify that all Open Positions and adjustments match internal records, enter any new Transaction or Open Position adjustments accordingly.
    b. Verify that the number of Options that will be automatically exercised on Expiration Date are correct.
    c. For any changes, indicate on the Expiry Response Screen under the "Override" column the total number of Options for each Series of Options to be exercised.
    d. Verify any Out-Of-The-Money Options or At-the-Money Options to be exercised and enter the number of Options under the "Override" column.
3. Validate changes using the reports and/or the on-line access to CDCC Clearing Application (in accordance with timeframes set forth in Section 2 of this Operations Manual).
4. If required, make any allowed modifications (in accordance with timeframes set forth in Section 2 of this Operations Manual).

Daily Expirations (other than Expiry Friday)

When CDCC receives Underlying Interests' closing and opening prices from the relevant Exchange, the prices are specified on the relevant Expiry Report and are used to determine the In-the-Money Options and the Out-of-the-Money Options.

Clearing Members have until the Close of Business on any Business Day up to the Expiration Date to submit an Exercise Notice with respect to American Style Options to CDCC. European Style Options can only be exercised on their Expiration Date.

OTCI Options can expire on any Business Day.

Typically, exercise instructions must be entered online on the CDCC Clearing Application by Clearing Members. However, if unavailable, the following manual process can be used to submit Exercise Notices to CDCC:

1. The proper CDCC Exercise Notice form must be used.
2. The authorization stamp of the Clearing Member must be affixed on the form.
3. The properly delivered Exercise Notice will be accepted at any CDCC office.

4. The Exercise Notice must be properly delivered by five minutes before Close of Business.
5. The Clearing Member staff who deliver the Exercise Notice must be available until CDCC processes the exercise.

The CDCC Clearing Application will ensure that there are sufficient Option Open Positions of the relevant Series of Options in the relevant account of the Clearing Member for exercising the relevant Exercise Notice; if not, CDCC will reject the Exercise Notice. If there are sufficient Option Open Positions, the Clearing Member's Long Position is immediately reduced by the number of Option Open Positions exercised.

AN EXERCISE NOTICE CAN BE CANCELLED UNTIL CLOSE OF BUSINESS ON THE DAY IT IS SUBMITTED.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

OPTIONS

Exercises

Delivery and payment on Exercised Positions are due on the Exercise Settlement Date.

Until Exercise Settlement Date, CDCC continues to require sufficient Margin to ensure that, if a Clearing Member defaults, any Exercise Notice submitted by it or assigned to it, as the case may be, will be completed.

Exercised Positions and Assigned Positions are reported to Clearing Members through relevant reports listed in Section 3 of this Operations Manual.

Assignments

After the Close of Business on any Business Day on which an Exercise Notice is submitted to CDCC, assignment of such Exercise Notice is made on a random selection basis, in which each account of a Member is treated separately. The reason for the separation is to ensure that each Clearing Member's Client Account(s), Firm Account(s), and Multi-Purpose Account(s) have the same probability of being assigned Exercise Notices. When a Clearing Member is assigned an Exercise Notice for a given account (e.g. the Firm Account) it may not allocate that assignment to another account (e.g. a Client Account).

An attempt will be made by CDCC to assign an Exercise Notice for more than 10 Options contracts in blocks not exceeding 10 contracts in each Series of Options.

Exercise Notices assigned to a Clearing Member's Client Account shall be allocated by the Clearing Member to any of its clients based on any method which is equitable and consistent with the rules of the relevant Exchange.

Automatic Exercise - Options and Options on Futures

To safeguard Clearing Members from possible errors, CDCC has instituted an Automatic Exercise procedure for expiring Series of Options. In simple terms, all In-the-Money Options and Options on Futures over predetermined thresholds are automatically exercised by CDCC, unless Clearing Members instruct otherwise.

CDCC establishes predetermined thresholds and informs Clearing Members that every Option and Option on Future above that threshold will be automatically exercised. CDCC will not automatically exercise any At-the-Money Option. CDCC provides a method for Clearing Members to make changes to the Automatic Exercise function of the CDCC Clearing Application. This allows Clearing Members to either opt in or opt out of the Automatic Exercise with respect to the Options and Options on Future they hold. For example, a Member can choose not to exercise an Option that is above the predetermined threshold but to exercise another Option that is At-the-Money or Out-of-the-Money.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

Exercised and Assigned Option Contracts

a) **Exercised Positions**

A Clearing Member who has exercised an Option has an obligation to either deliver the Underlying Interest (in the case of a Put Option) or pay the Exercise Price (in the case of a Call Option).

b) **Assigned Positions**

A Clearing Member who has been assigned an Exercise Notice has the obligation to pay the Exercise Price upon delivery of the Underlying Interest (in the case of a Put Option) or to deliver the Underlying Interest against payment (in the case of a Call Option).

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

FUTURES

Submission of Tender Notices

Tender Notices must be submitted before Close of Business during the relevant FIFO Period (which, subject to any contract adjustment by the Exchange, shall be as follows):

CGB, CGF, CGZ and LGB	two Business Days preceding the first Business Day of the Delivery Month up to and including the second last Business Day preceding the last Business Day of the Delivery Month.
MCX	before Close of Business on the last trading day.

All outstanding Short Positions in BAX, EMF, SXF, SXM, SCF, Sector Index Futures, Share Futures, and Options on Futures are automatically tendered on the last trading day, as per Contract Specifications, after Close of Business.

All outstanding Short Positions in ONX, OIS are automatically tendered on the first Business Day following the contract month, as per Contract Specifications, after Close of Business.

Assignment of Tender Notices

CDCC assigns all Tender Notices to open Long Positions on a random basis with the exception of the Government of Canada Bond Futures (CGB, LGB, CGF and CGZ). Assignments for the CGB, LGB, CGF and CGZ Futures are processed on a First-In-First-Out (FIFO) basis.

Delivery of the Underlying Interest and payment of the Settlement Price is effected by Clearing Members as instructed by CDCC.

FIRST-IN-FIRST-OUT (FIFO) ASSIGNMENT PROCESS

Description of Procedures

The Delivery Months for the CGB, CGF, LGB and CGZ Futures contracts are March, June, September and December as prescribed by the Exchange. When a Member submits a Tender Notice with respect to a Short Position, a Long Position is assigned on a First-In-First-Out (FIFO) basis. CDCC sends out an Operational Notice prior to each relevant FIFO Period to remind Clearing Members of the procedures involved.

On the sixth Business Day prior to the first Business Day of the Delivery Month, each Clearing Member holding Long Positions in the relevant Series of Futures must declare on the CDCC Clearing Application its Long Positions in chronological order for each of its accounts. The entries must include the date the position was opened, the number of contracts and the account. When CDCC assigns a Tender Notice, the Long Position with the oldest date will be assigned first and the Long Position with the most recent date will be assigned last.

During the FIFO Period, Clearing Members must ensure that they update their declarations on a daily basis before Close of Business.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

FIXED INCOME TRANSACTIONS

CDCC acts as central counterparty to all Fixed Income Transactions that are submitted by Clearing Members to CDCC for clearing. All Fixed Income Transactions shall be submitted for clearing to CDCC through the CDS trade matching facility routing matched trades to CDCC. As a result of these Transactions being novated to CDCC, CDCC will be either the buyer or the seller of all settlement records that are sent to the Central Securities Depository.

Various transmissions of settlement records will be sent by CDCC to the Central Securities Depository on a daily basis.

Same Day Transactions gross settlement records

For Same Day Transactions, two settlement records consisting of settlement instructions (Gross Delivery Requirements and Gross Payment Against Delivery Requirements) will be sent gross to the Central Securities Depository to be settled on a real-time basis throughout the day immediately after each Same Day Transaction is novated to CDCC until the Submission Cut-Off Time specified in Section 2 of this Operations Manual.

Forward Settlement Transactions and Futures Contracts on an Acceptable Security net settlement records

For Forward Settlement Transactions and Futures Contracts on Acceptable Securities, settling on the next Business Day, two settlement records consisting of net settlement instructions (Net Delivery Requirements and Net Payment Against Delivery Requirements) will be sent to the Central Securities Depository on a net basis at the Netting Cut Off Time specified in Section 2 of this Operations Manual for settlement on the next Business Day.

Morning net DVP settlement process

In respect of any Pending Payment Against Delivery Requirements at the Morning Netting Cycle Timeframe specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Morning Net Payment Against Delivery Requirements) to the Central Securities Depository reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member. The Clearing Member or its Settlement Agent shall have sufficient funds in its CDS Funds Account to settle the lesser of (i) its Morning Net Payment Against Delivery Requirement and (ii) the amount of the CDCC Daylight Credit Facility during the Morning Net DVP Settlement Timeframe specified in Section 2 of this Operations Manual.

Afternoon net DVP settlement process

In respect of any Pending Settlement Requirements at the Afternoon Netting Cycle Timeframe specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Afternoon Net DVP Settlement Requirements) to the Central Securities Depository reducing any Pending Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Delivery Requirements of CDCC in favour of the same Clearing Member in respect of the same Acceptable Security, and/or reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member. The Clearing Member, or its Settlement Agent, shall have sufficient funds and sufficient Acceptable Securities in its CDS Funds Accounts and CDS Securities Accounts to settle its Afternoon Net DVP Settlement Requirements by the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual.

Delivery

Securities delivery against payment is effected on a DVP basis through the Central Securities Depository.

In the event of a failed or partial delivery, CDCC will take appropriate action in accordance with this Manual and Section A-804 of the Rules.

CDCC shall determine the net settlement instructions by Clearing Member, CUSIP/ISIN and Settlement Date for all Transactions comprised in the Forward Settlement Transactions netting process (as specified in the above section entitled "Forward Settlement Transactions and Futures Contracts on an Acceptable Security net settlement records") submitted to CDCC for clearing as of the Netting Cut Off Time. These settlement instructions shall be submitted to the relevant Central Securities Depository on a daily basis and in the form and settlement tranche acceptable to the Central Securities Depository for this purpose.

For Same Day Transactions, CDCC shall determine the gross settlement instructions (Gross Delivery Requirements and Gross Payment Against Delivery Requirements) by Clearing Member and the applicable CUSIP/ISIN, and submit such instructions to the relevant Central Securities Depository (in the form and settlement tranche acceptable to such Central Securities Depository) immediately after each Same Day Transaction is novated to CDCC for real-time settlement. Notwithstanding the foregoing, at the Morning Netting Cycle Timeframe, CDCC shall cancel previously issued Pending Payment Against Delivery Requirements and replace them by Morning Net Payment Against Delivery Requirements by Clearing Member (as specified in the above section entitled "Morning net DVP settlement process").

In the event of a Failed Delivery for a particular settlement tranche to a Net Delivery Requirement or to an Afternoon Net DVP Settlement Requirement consisting of an obligation to deliver Acceptable Securities by the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual, CDCC shall, on a best efforts basis, attempt to coordinate a partial delivery among those Receivers of Securities for that particular settlement tranche of the relevant Acceptable Security. In the event that no partial settlement is possible, the settlement tranche will be included in the Rolling Delivery Obligation of the failing Clearing Member and CDCC shall re-attempt settlement of the failed settlement tranche on the next Business Day. In the case of a Failed Delivery with respect to a Gross Delivery Requirement resulting from a Same-Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time to be settled by the End of Day DVP Settlement Time, CDCC will fail or partially deliver for the same quantity of Acceptable Securities to the Clearing Member who is the Receiver of Securities with respect to the relevant Same Day Transaction.

In the event of a Failed Payment Against Delivery at the Morning Net DVP Settlement Timeframe specified in Section 2 of this Operations Manual, CDCC shall impose a fine on the Clearing Member corresponding to the charges which are levied on CDCC for the usage of the CDCC Daylight Credit Facility as a result of this Failed Payment Against Delivery. If the Clearing Member still does not have sufficient funds in its CDS Funds Account or that of its Settlement Agent at the Central Securities Depository to settle the relevant Morning Net Payment Against Delivery Requirement, or in the amount of the CDCC Daylight Credit Facility (whichever is less), by 11:00 a.m., the Clearing Member shall be deemed a Non-Conforming Member, in addition to any other remedies that CDCC may apply to such situation in accordance with Subsection A-806(1) of the Rules.

In the event of a Failed Payment Against Delivery at the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual, the Clearing Member shall be deemed a Non-Conforming Member and shall be required to pay to CDCC any charges which are levied on CDCC for the overnight financing of this Failed Payment Against Delivery, in addition to any other remedies that CDCC may apply to such situation in accordance with Subsection A-806(2) of the Rules. CDCC will assist the Clearing Member to remedy the situation so that the Clearing Member can maintain its conforming status. As DVP is not available after the End of Day DVP Settlement Time at the Central Securities Depository (CSD), the Clearing Member must deliver the funds (or acceptable equivalent) outside of the CSD's systems to CDCC prior to CDCC delivering the securities via the CSD.

Buy-In Process (excluding Fixed Income Variation Margin Buy-Ins)

For a Buy-In in respect of the Acceptable Security, the following applies. As set forth in Subsection A-804(3) of the Rules, CDCC may effect a Buy-In transaction on its own initiative or pursuant to a formal request by a Receiver of Securities affected by a Failed Delivery by purchasing the missing quantity of the relevant Acceptable Securities on the open market.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

When initiated by a Receiver of Securities, the Buy-In process shall be as follows:

1. The Receiver of Securities who wants to initiate a Buy-In must send to CDCC the appropriate Buy-In Scan Form (which is accessible on CDCC's Secured Website) duly completed, with the following information:
   a. Clearing Member's Name;
   b. Clearing Member's Number;
   c. The Acceptable Security (ISIN) involved;
   d. The total quantity of the Failed Delivery;
   e. The quantity requested in the Buy-In;
   f. The Buy-In delivery date, which shall be the current Business Day + not less than two (2) complete Business Days.

   The Buy-In Scan Form must be submitted to CDCC in the prescribed format with the authorization stamp of the Clearing Member properly affixed on the form (with initials).

2. Upon receiving the duly completed Buy-In Scan Form from a Receiver of Securities, CDCC will work with the Provider(s) of Securities responsible for the Failed Delivery in order to validate if the delivery can be made within the number of Business Days specified in the Buy-In Scan Form (the "Buy-In Notice Delay").

3. At the expiry of the Buy-In Notice Delay, if the Provider(s) of Securities have not delivered the relevant Acceptable Securities, CDCC will initiate a cash trade on the open market.

4. Once delivery is received by CDCC on the cash trade, CDCC will deliver the Acceptable Securities to the Receiver of Securities that requested the Buy-In transaction.

5. All fees incurred to CDCC, including all costs with respect to the Buy-In transaction shall be charged to the Provider(s) of Securities responsible for the Failed Delivery. Such fees will be included on the Monthly Clearing Fees Invoice (MB01) of the second Business Day of each month as a separate pay figure, payable to CDCC on the 5th Business Day of each month through LVTS or any other payment method approved by CDCC.

SETTLEMENT

SETTLEMENT

INTRODUCTION

CDCC provides the mechanism for a single cash settlement with respect to amounts which are not settled through a Central Securities Depository due by a Clearing Member to CDCC and by CDCC to such Clearing Member on a daily basis, as prescribed in Paragraph A-801(2)(a) of the Rules. Clearing Members are able to make a single payment to CDCC or receive a single payment from CDCC that represents the net value of their purchases, sales, gains and losses and, on a monthly basis, clearing fees. Additionally, the CDCS incorporates the amounts due from the Clearing Members for Margin (excluding for the Net Variation Margin Requirement) and the exercise/assignment Settlement Amounts of cash settled Transactions.

Settlement of trading in a given currency is kept separate throughout the clearing procedure. All payments in the Canadian currency to and from CDCC are collected via an irrevocable payment processing system, known as the Large Value Transfer System (LVTS), or any other payment method approved by CDCC. Any US dollar payments are collected via a payment processing system known as Financial Electronic Data Interchange (FEDI). As described in the Risk Manual, the amount of Margin due by a Clearing Member on a given day is computed on the basis of that day's Open Positions shown on the relevant report.

SETTLEMENT CALCULATION

The calculation of a Clearing Member's Net Daily Settlement amount is based on Transactions (including adjustments, exercises, tenders and assignments) and Margin requirements and, on a monthly basis, clearing fees.

The Net Daily Settlement amount for each Clearing Member is determined in the following manner:

(i) The amount of Margin required for the Margin ~~Fund Account and Difference~~ Fund Account are compared with Margin Deposits made by the Clearing Member for such accounts.

(ii) The premiums, Futures Settlement of Gains and Losses, cash settled exercise/assignment Settlement Amounts and cash adjustments for each account type (Client Account(s), Firm Account(s) and Multi-Purpose Account(s)) are netted to a single pay or collect figure.

All cash settlements to CDCC are to be made to CDCC’s settlement account at the Bank of Canada, or to any other account of CDCC with a Schedule I bank, as designated by CDCC.

FINES

CDCC applies fines with regards to late payments to deter Clearing Members from being late in the performance of their payment obligations.

SETTLEMENT

Overnight Settlement

Payments for overnight settlement (Futures mark-to-market, premiums, Margin shortfalls, etc.) must be received by 7:45 a.m. the next Business Day for each Clearing Member (excluding LCMs) and 9:00 a.m. for each LCM.

If a payment is late, CDCC will notify the Clearing Member that it is being fined. The fine structure is as follows:
Based on a rolling thirty days – if there has been a prior occurrence within the preceding thirty days, it is the second occurrence.

The fine schedule described below is subject to the Escalation Procedure applicable for operational issues detailed in Section 11 of this Manual.

For Clearing Members not in a Tri-Party Agreement

First occurrence of a late payment:

- if CDCC receives the payment in its Bank of Canada account by 7:55 a.m. the next Business Day, there will be no fine.
- if the payment is received by 8:30 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment is received by 8:59 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

On the second or more occurrences of a late payment:

- if CDCC receives the payment in its Bank of Canada account by 7:55 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment is received after 7:55 a.m. but before 8:30 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment is received by after 8:30 a.m. but before 8:59 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

For Clearing Members (excluding LCMs) in a Tri-Party Agreement – Margin Shortfalls only

First occurrence of a late payment or delivery:

- if CDCC receives the payment in its Bank of Canada account or if CDCC has evidence that the securities have been received in the appropriate account by 7:55 a.m. the next Business Day, there will be no fine.
- if the payment or delivery is received by 8:30 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment or delivery is received by 8:59 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment or delivery is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

On the second or more occurrences of a late payment or delivery:

- if CDCC receives the payment in its Bank of Canada account or if CDCC has evidence that the securities have been received in the appropriate account by 7:55 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment or delivery is received after 7:55 a.m. but before 8:30 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment or delivery is received by after 8:30 a.m. but before 8:59 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment or delivery is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

SETTLEMENT

For LCMs – Margin Shortfalls only

First occurrence of a late payment or delivery:

- if CDCC receives the payment in CDCC's Bank of Canada account designated for such Limited Clearing Member or if CDCC has evidence that the securities have been received in the appropriate account by 9:10 a.m. the next Business Day, there will be no fine.
- if the payment or delivery is received by 9:45 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment or delivery is received by 10:14 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment or delivery is not received by 10:15 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

On the second or more occurrences of a late payment or delivery:

- if CDCC receives the payment in CDCC's Bank of Canada account designated for such Limited Clearing Member or if CDCC has evidence that the securities have been received in the appropriate account by 9:10 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment or delivery is received after 9:10 a.m. but before 9:45 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment or delivery is received by after 9:45 a.m. but before 10:14 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment or delivery is not received by 10:15 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

MARGIN PROCESSING

MARGIN FUND ACCOUNT

Margin Fund Account is the CDCS record provided to each Clearing Member containing all Margin deposited by such Clearing Member to CDCC, in respect of such Clearing Member's Base Initial Margin (or Adjusted Base Initial Margin, as the case may be), Additional Margin for ~~Concentration~~Market Liquidity Risk, Additional Margin for Specific Wrong-Way Risk, Additional Margin for Mismatched Settlement Risk, Additional Margin for Intra-Day Variation Margin Risk, Additional Margin for Unpaid Option Premium Exposure Risk, Additional Margin for Banking Holiday Risk, Additional Margin for Variation Margin Delivery Risk, Additional Capital Margin Risk, Additional Margin for Uncovered Risk of Limited Clearing Members, Variation Margin for Options, and Variation Margin for Unsettled ~~Item~~Items, in accordance with the Risk Manual and as set forth in Section 8-1 hereof.

In addition to the foregoing, an amount may be requested from a Clearing Member for the protection of the Corporation, Clearing Members or the investing public, in accordance with section A-702 of the Rules.

Each Clearing Member must record in its Margin Fund Account any deposit made to cover the shortfalls resulting from the requirements. Deposits must be in the form of Eligible Collateral, as specified in the Risk Manual, in an amount sufficient, taking into account the market value and applicable haircuts as specified in Section A-707.

~~DIFFERENCE FUND ACCOUNT~~

~~The **Difference Fund Account** is a sub-Account of the Margin Fund Account.~~

~~The Difference Fund Account is a CDCS record provided to each Clearing Member containing any Additional Margin deposited by such Clearing Member to the CDCC, in respect of the following:~~

~~(1) Unsettled Item Margin (excluding CGB, CGF, CGZ, LGB)~~

~~Security Funds, as such term is defined in Sections B-401, C-501 and D-301 of the Rules, corresponding to an amount equal to not less than 105% of the market value of the Underlying Interest which a Clearing Member has failed to timely deliver, in accordance with Sections B-412, C-517 and D-307 respectively of the Rules.~~

~~(2) Additional Capital Margin~~

~~The amount by which the Margin requirements of a Clearing Member (other than an LCM) exceed its capital, as described in the Risk Manual.~~

~~(3) Advance Calls for Settlement of Losses~~

~~An amount that CDCC estimates will be needed to meet losses resulting from particular market conditions or price fluctuations, in accordance with Section C-303 of the Rules.~~

~~(4) OTCI Additional Margin~~

~~An amount representing the premium value collected from the Buyer before an OTCI Option is confirmed, which amount shall be available for withdrawal the morning after the Transaction has been processed, in accordance with Section D-107 of the Rules.~~

~~(5) Discretionary Margin~~

~~An amount may be requested from a Clearing Member for the protection of the Corporation, Clearing Members or the investing public, in accordance with section A-702 of the Rules.~~

~~(6) **Additional Margin for Intra-Day Variation Margin Risk**~~

~~Additional Margin for Intra-Day Variation Margin Risk may be requested from a Clearing Member, as described in the Risk Manual.~~

~~**(7) Additional Margin for Mismatched Settlement Risk**~~

~~Additional Margin for Mismatched Settlement Risk may be requested from a Clearing Member, as described in the Risk Manual.~~

~~**(8) Additional Margin for Uncovered Risk of LCMs**~~

~~Additional Margin for Uncovered Risk of LCMs may be requested from LCMs, as described in the Risk Manual.~~

~~**(9) Additional Margin for Variation Margin Delivery Risk**~~

~~Additional Margin for Variation Margin Delivery Risk may be requested from Clearing Members, as described in the Risk Manual.~~

Withdrawals

Clearing Members may request to withdraw any surplus amount from the Margin Fund Account~~ and Difference Fund Account~~, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual. CDCC will respond within the specified time set forth in Section 2 and, on a best effort basis, approve the withdrawal in CDCC Clearing Application.

Substitutions

A Clearing Member may request to substitute a specific CUSIP/ISIN previously pledged in the Margin Fund Account ~~and Difference Fund Account~~ to the Corporation. The Clearing Member must first pledge equivalent securities and withdraw the existing securities subject to substitution. The value of the equivalent securities so pledged must be equal to or in excess of the securities being withdrawn, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual.

CDCC verifies the validity of each deposit made by Clearing Members and ensures that withdrawals of existing securities subject to substitution do not create deficits in the Clearing Member's Margin Fund Account~~ or Difference Fund Account.~~. CDCC will respond within the specified time set forth in Section 2 and, on a best effort basis, approve the substitution in CDCC Clearing Application.

Pledging (CDS)

Securities pledges in the Margin~~ Fund Account and Difference~~ Fund Account must be performed through CDSX in CDCC's account. The entries on the pledging screen of the CDCC Clearing Application are matched by CDCC to corresponding entries on the reporting system of the relevant Central Securities Depository.

In some cases an exchange of document at a CDCC Office by the Clearing Member (accompanied by a screen print of the entry bearing the Clearing Member's stamp) may be accepted by CDCC as constituting a physical deposit or withdrawal.

MARGIN PROCESSING

After performing all the validation processes, CDCC confirms within the CDCC Clearing Application the Clearing Member's deposits and/or withdrawals.

Deposits, withdrawals and changes thereto will be reflected on the immediately following Business Day's Deposits and Withdrawals Report (MA01). In accordance with the Rules, any discrepancies that the Clearing Member notices against its own records should be reported to CDCC immediately.

Pledging (Tri Party - Securities Account with an Approved Custodian)

Subject to certain conditions, the Corporation may allow Clearing Members to pledge non-cash collateral for the purpose of meeting their Margin requirements pursuant to Rule A-7 (excluding Net Variation Margin Requirements and any other Margin which can otherwise only be cash settled) to a securities account maintained at a third party securities intermediary. The securities intermediary must enter into an Account Control Agreement with respect to the securities account and be an Approved Custodian, each as defined in the Rules.

Use of the Securities Account

1. The securities account shall only be maintained by a securities intermediary which is an Approved Custodian, as defined in the Rules.

2. Any securities held in the securities account maintained by the Approved Custodian, in the name of the Clearing Member, shall be subject to an Account Control Agreement.

3. The Account Control Agreement is a standard agreement that meets certain requirements, as prescribed in the Rules.

4. The securities account may not be used for Net Variation Margin Requirements or for settlement purposes.

5. The respective rights and obligations of the Clearing Member and CDCC with respect to the securities collateral held in the securities account are subject to the Rules, including:

    a. All deposits, withdrawals and substitutions in the securities account are subject to the timeline described in Section 2 of this Manual and to the collateral policy described in Section 2 (Eligible Collateral) of the Risk Manual;

    b. All deposits, withdrawals and substitutions made in the securities account shall also be entered in CDCC Clearing Application in accordance with the timeline described in Section 2 of this Manual and to the collateral policy described in Section 2 (Eligible Collateral) of the Risk Manual;

    c. Any withdrawal of securities held in the securities account is subject to CDCC's approval. The withdrawal must be entered in CDCC Clearing Application by the Clearing Member. A withdrawal authorization form signed by the Clearing Member must be transmitted to CDCC and must include the Clearing Member's approved stamp. CDCC will then, within the specified time to respond to a withdrawal request specified in Section 2, sign and transmit the withdrawal authorization form to the Custodian to proceed with the withdrawal;

    d. Any substitution is subject to the deposit by the Clearing Member of the replacement securities in the securities account before the withdrawal of the replaced securities. Both the deposit and the withdrawal shall also be entered in CDCC Clearing Application by the Clearing Member. A substitution authorization form signed by the Clearing Member must be transmitted to CDCC and must include the Clearing Member's approved stamp. CDCC will then, within the specified time to respond to a substitution request specified in Section 2, sign and transmit the substitution authorization form to the Custodian to proceed with both the deposit and the withdrawal.

Intra-Day Margin Calls

CDCC encourages its Clearing Members to cover Intra-Day Margin Calls with collateral other than cash.

The fine schedule described below is subject to the Escalation Procedure applicable for operational issues detailed in Section 11 of this Manual.

Clearing Members (excluding LCMs) have one (1) hour from notification to cover an Intra-Day Margin Call. If the payment or delivery is late, the following fines shall apply:

- if the payment or delivery is received more than 1 hour after but less than 1 hour and 15 minutes from notification, CDCC will impose a $500 fine.
- if the payment or delivery is received more than 1 hour and 15 minutes but less than 1 hour and 30 minutes from notification, CDCC will impose a $1,000 fine.
- if the payment or delivery is not received by 1 hour and 30 minutes from notification, CDCC will deem the Clearing Member (excluding LCMs) a Non-Conforming Member.

LCMs have two (2) hours from notification or until such Settlement Time as may be provided in Section 2 to cover an Intra-Day Margin Call. If the payment or delivery is late, the following fines shall apply:

- if the payment or delivery is received more than 2 hours after but less than 2 hours and 15 minutes from notification, CDCC will impose a $500 fine.
- if the payment or delivery is received more than 2 hours and 15 minutes but less than 2 hours and 30 minutes from notification, CDCC will impose a $1,000 fine.

if the payment or delivery is not received within 2 hours and 30 minutes from notification, CDCC will deem the LCM a Non-Conforming Member

(FIXED INCOME) VARIATION MARGIN ACCOUNT

The Fixed Income Variation Margin Account is the CDCS record provided to each Clearing Member listing all Margin deposits made by such Clearing Member to CDCC for (Fixed Income) Net Variation Margin Requirement purposes only, in accordance with Section D-607 of the Rules, or otherwise as set forth in Section 8-1 hereof.

(Fixed Income) Net Variation Margin Requirement Settlement

In order to meet a (Fixed Income) Net Variation Margin Requirement, Clearing Members are required to pledge, through CDSX, to CDCC's (Fixed Income) Variation Margin Account, Margin deposits in the form of Eligible Collateral, as specified in the Risk Manual, in an amount sufficient, taking into account the market value and applicable haircuts as specified in Section A-707, to cover any positive variation of the (Fixed Income) Net Variation Margin Requirement owed by a Clearing Member to CDCC.

While the Eligible Collateral must be delivered and pledged to CDCC through CDSX, each Clearing Member must in parallel record in its (Fixed Income) Variation Margin Account such pledge, or any pledge release, to match the entries. The (Fixed Income) Variation Margin Account is solely used to record the pledges or pledge releases, as the case may be, of Margin deposits for (Fixed Income) Net Variation Margin Requirement purposes.

Delivery of the (Fixed Income) Net Variation Margin Requirement

On any given Business Day, each Clearing Member must deliver to the Corporation in CDCC's account at CDS, Eligible Collateral for (Fixed Income) Net Variation Margin Requirement purposes, taking into consideration any shortfall resulting from the variation of the (Fixed Income) Net Variation Margin Requirement, as compared to the (Fixed Income) Net Variation Margin Requirement calculated on the previous Business Day, and the fluctuation of the market value of the Eligible Collateral previously pledged by such Clearing Member to meet its (Fixed Income) Net Variation Margin Requirement.

Upon accepting Eligible Collateral that has been pledged to it through CDSX, CDCC may re-pledge and deliver the Eligible Collateral to a receiving Clearing Member, subject to CDCC's first ranking pledge, and the receiving Clearing Member shall be entitled to re-pledge or re-hypothecate the Eligible Collateral delivered to it.

Each Clearing Member is also required to return to the Corporation the same CUSIP/ISIN that had been allocated and pledged to it by the Corporation as part of the (Fixed Income) Net Variation Margin Requirement delivery, in an amount sufficient to meet the (Fixed Income) Net Variation Margin Requirement shortfalls as indicated on the MS10 report. Clearing Members must return the same CUSIP/ISIN in accordance with the (Fixed Income) Net Variation Margin Requirement Settlement Times. If a Clearing Member fails to return to the Corporation the specific CUSIP/ISIN securities listed on the report but returns equivalent securities instead (a “Fixed Income Variation Margin Delivery Failure”), the Clearing Member will be subject to fines as described below.

Distribution of the (Fixed Income) Net Variation Margin Requirement Collateral

The Corporation will transfer to each Clearing Member being owed a net amount resulting from a change in such Clearing Member’s (Fixed Income) Net Variation Margin Requirement or from the fluctuation of the market value of the Eligible Collateral previously pledged by such Clearing Member to meet its (Fixed Income) Net Variation Margin Requirement, the Variation Margin securities received by the Corporation as part of the (Fixed Income) Net Variation Margin Requirement. The Corporation will in priority return the same CUSIP/ISIN previously pledged to the Corporation by such Clearing Member, subject to the specific procedures described below in the event of a Fixed Income Variation Margin Delivery Failure or of a substitution request.

Substitution of Pledged Securities Collateral for the (Fixed Income) Variation Margin Account

1. **(Fixed Income) Variation Margin Account Collateral substitution request:**

   A Clearing Member may request to substitute a specific CUSIP/ISIN previously pledged in the (Fixed Income) Variation Margin Account to the Corporation. The request for substitution must be received by the Corporation before 11:00 a.m. for same day settlement. Clearing Member must first pledge equivalent securities and withdraw the existing securities subject to substitution. The value of the equivalent securities so pledged must be equal to or in excess of the securities being withdrawn. Substitution of a specific CUSIP/ISIN requested for same day settlement will be completed by 3:00 p.m. by the Corporation, subject to the Buy-In process below.

2. **(Fixed Income) Variation Margin Account Securities Collateral substitution notice:**

   The Corporation will inform by 12:00 p.m. (noon) any Clearing Member subject to a substitution request (the “Holder of securities”) for a same day settlement. The Holder of securities will have until 3.00 p.m. to deliver the securities to CDCC's (Fixed Income) Variation Margin Account. Failure to deliver by the Holder of securities by the cut-off time will be considered a Fixed Income Variation Margin Delivery Failure and will result in fines being applied to the Holder of securities as described below.

FIXED INCOME VARIATION MARGIN DELIVERY FAILURE

Fines

CDCC will apply fines for failure to return distributed securities.

CDCC will apply fines for failure to return securities subject to a substitution notice, by the appropriate deadline.

For each day between the day of the original return obligation and the delivery date (the "Fail Period") a fine will be applied (Fail fees). The Fail fee is based on a rate equal to 1-month CDOR, which is fixed on a monthly basis and is applied daily. CDCC shall immediately notify the Clearing Member to which a fine is imposed.

Throughout the Fail Period, CDCC will require to receive Eligible Collateral of a value equivalent to the value of the unreturned securities and CDCC will deliver such replacement securities to the receiving Clearing Member (the "Replacement Securities"). At the end of the Fail Period, the Replacement Securities will be returned from the receiving Clearing Member to the delivering Clearing Member.

The fines described above are subject to the Escalation Procedure applicable for operational issues detailed in Section 11 of this Manual.

Collection of Fines

CDCC will collect any applicable fines with the month-end clearing fee billing.

Fixed Income Variation Margin Buy-In process for Fixed Income Variation Margin Delivery Failure

The Receiver of securities affected by a Fixed Income Variation Margin Delivery Failure may request that the Corporation execute a Buy-In on the day following the market standard settlement (T+2 / T+3, where T is the day of the original date of the request).

Same day settlement will be executed by CDCC on a best efforts basis. In the event of a failure to deliver by the counterparty to the Buy-In transaction on the same day, CDCC will execute the Buy-In transaction the following day without liability.

The Corporation shall only execute a Buy-In transaction pursuant to a formal request by a Receiver of securities affected by a Failed Delivery, by purchasing on the open market the collateral of the specified quantity and CUSIP/ISIN.

When initiated by a Receiver of securities, the Buy-In process shall be as follows:

1. The Receiver of securities who wants to initiate a Buy-In must send to the Corporation the appropriate Buy-In Scanned Form (which is accessible on CDCC’s Secured Website) duly completed with the following information:
   a. Clearing Member’s Name;
   b. Clearing Member’s Number
   c. The specific securities (Eligible Collateral) (ISIN) involved;
   d. The total quantity of the Failed Delivery;
   e. The quantity requested in the Buy-In;
   f. The Buy-In delivery date, which shall be the current Business Day + no less than two (2) complete Business Days.

   The Buy-In Scanned Form must be submitted to CDCC in the prescribed format with the authorization stamp of the Clearing Member properly affixed on the form (with initials) before 10:00 a.m.

2. Upon receiving the duly completed Buy-In Scanned Form from a Receiver of securities, the Corporation will work with the Holder(s) of securities responsible for the Failed Delivery in order to validate if the delivery can be made within the number of Business Days specified in the Buy-In Scan Form (the “Buy-In Notice Delay”).

3. At the expiry of the Buy-In Notice Delay, if the Provider(s) of securities has not delivered the relevant securities, the Corporation will initiate a cash trade on the open market.

4. Upon receipt of the securities, CDCC will deliver the requested securities to the Receiver that initiated the Buy-In transaction.

5. All fees incurred by the Corporation, including all costs with respect to the Buy-In transaction shall be charged to the Provider(s) of securities responsible for the Failed Delivery. Such fees will be included on the Monthly Clearing Fees Details Report (MB01) produced on the second Business Day of each month as a separate pay figure, payable to the Corporation on the fifth Business Day of each month through LVTS or any other payment method approved by the Corporation.

CLEARING FUND

Each Clearing Member (excluding LCMs) approved to clear Exchange Transactions and/or OTCI Transactions and/or Fixed Income Transactions shall maintain a deposit in the Clearing Fund of the amounts from time to time required by CDCC in accordance with Rule A-6. The Clearing Fund has been established to protect CDCC and its Clearing Members (including their Affiliate(s)) from potential defaults and other market events and shall be used for the purposes set out in Section A-609 and Subsection A-701(2) of the CDCC Rules.

Each Clearing Member's (excluding LCMs) contribution includes a required Base Deposit and a Variable Deposit. The details of the Base and Variable Deposits are set forth in Rule A-6.

Clearing Fund Statement Report

On the first Business Day of each calendar month, CDCC shall issue to each Clearing Member (excluding LCMs) a Clearing Fund statement that shall list the current amount of such Clearing Member's deposits to the Clearing Fund and the amount of deposit, which is based on the monthly calculation of the Variable Deposit, required of such Clearing Member. CDCC will also issue a Clearing Fund statement (MA71) intra-monthly if an increase to the Variable Deposit is necessary. Any deficit between the amounts held on deposit and the deposit required to be made by a Clearing Member must be satisfied by 2:00 p.m. on the next Business Day.

Deposits

Deposits to the Clearing Fund shall be in the form of Eligible Collateral as specified in the Risk Manual, in an amount sufficient, taking into account the market value and applicable haircuts as specified in Section A-707. Deposits to the Clearing Fund are made and valued in the same manner and are subject to the same deadlines as for Margin deposits, as set forth in Section 2 of this Operations Manual.

Withdrawals

Clearing Members (excluding LCMs) may request to withdraw any surplus amount from the Clearing Fund, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual.

Substitutions

Substitutions of assets (other than cash) in the Clearing Fund are made in the same manner and subject to the same deadlines as Margin Fund Account substitutions of assets (other than cash), as set forth in Section 2 of this Operations Manual.

Pledges

THE FUTURE IS YOURS TO SEE.

MARGIN PROCESSING

Securities pledges must be performed through CDSX in CDCC's account. The entries on the pledging screen of the CDCC Clearing Application are matched by CDCC to corresponding entries on the reporting system of the relevant Central Securities Depository.

CLEARING FEES

CLEARING FEES

Clearing services fees

Clearing fees are charged to both Clearing Members submitting a Transaction for clearing to CDCC and are based on the number of contracts involved. There is a minimum monthly clearing fee charge with respect to certain product types (Futures, Options and OTCI (other than Fixed Income Transactions)). Once a Clearing Member, otherwise eligible to do so in accordance with the Rules, starts using a particular clearing service by submitting a first Transaction of such product type, the applicable minimum monthly clearing fee shall be charged to the Clearing Member thereafter whether the Clearing Member actually uses the services or not during any given month, until the Clearing Member duly notifies CDCC in writing that it wishes to withdraw from the clearing services for that product type, effective sixty (60) days after CDCC receives such notice, provided there is no outstanding Transaction of such product type standing to an account of the Clearing Member at such time. Clearing Members should refer to the CDCC website www.cdcc.ca for a complete list of applicable fees.

Clearing fees are collected as a separate pay figure and are payable to CDCC on the morning of the 5th Business Day of each month through LVTS or any other payment method approved by CDCC. The MB01 Monthly Clearing Fees Invoice, MB02 Monthly Clearing Fees Details Reports and MB03 Monthly Fixed Income Clearing Fees Invoice are generated on every 2nd Business Day of each month and are available to Clearing Members on the morning of the 3rd Business Day of each month.

Fees for additional services

There are a number of discretionary services available to Clearing Members, in addition to the normal clearing services. These are published periodically as an Operational Notice to Members and can be viewed on the Secured Website. CDCC issues a statement on a monthly basis for these services. The fees are collected as per the date on the statement through LVTS or any other payment method approved by CDCC.

Fees for cost incurred at CDS (or other Central Securities Depository)

Any settlement cost incurred by CDCC within CDSX (or the settlement platform of another Central Securities Depository) will be charged to the Clearing Member with which CDCC is settling. Such cost will be included on the Monthly Clearing Fees Details Report (MB01) of the second Business Day of each month as a separate pay figure, payable to CDCC on the 5th Business Day of each month through LVTS or any other payment method approved by CDCC.

Clearing Members shall designate up to three (3) individuals within their firm who will be responsible for handling the Clearing Member's User Profiles ("Security Officers"). The designation of Securities Officers is done by filing with CDCC a CDCS Clearing – Security Officer Identification form, which form shall be renewed on an annual basis.

Once duly designated, a Security Officer shall submit a CDCS Clearing User Profile Request form to request that CDCC add or delete a User Profile (this form is accessible on CDCC's Secured Website).

SECURITY OFFICER

SECURITY OFFICER

The Security Officer must complete this form with the authorization stamp of the Clearing Member properly affixed on the form (with initials). When the form is complete, the Clearing Member can either scan the form and send it to the Corporate Operations group e-mail address: cdcc-ops@tmx.com, or fax the form to one of CDCC's offices.

Upon receipt of the form, the process for the addition / deletion is performed by one of CDCC's senior managers.

ESCALATION PROCEDURE

ESCALATION PROCEDURE

A failure by a Clearing Member to meet a payment, transfer, deposit, delivery, or acceptance of delivery when such obligation becomes due under the Rules (for the purpose of this Section 11 - Escalation Procedure, a "Payment Failure") as a result of an operational issue, including any material systems failure, malfunction, or delay encountered by a Clearing Member or its securities intermediary, including its Settlement Agent, Approved Depository, or Approved Custodian, (an "Operational Issue") shall be managed by the Corporation in accordance with the following procedure, (the "Escalation Procedure").

1) Communication

a) For the purposes of this Escalation Procedure:
   i) a CDCC Level 1 contact shall be a Director Operations, or its equivalent;
   ii) a CDCC Level 2 contact shall be a Vice-President Operations, or its equivalent;
   iii) a CDCC Level 3 contact shall be the President and Chief Clearing Officer or Vice-President and Chief Risk Officer;
   iv) a Clearing Member Level 1 contact shall be a Director of Operations, or its equivalent;
   v) a Clearing Member Level 2 contact shall be a Vice-President Operations, or its equivalent; and
   vi) a Clearing Member Level 3 contact shall be a senior executive reporting directly to the president of the Clearing Member, or to its equivalent in the absence of a senior executive of the Clearing Member bearing the title "president".

b) The CDCC Level 1 contact shall, immediately upon acquiring actual knowledge or confirmation of a Payment Failure by a Clearing Member, notify the Clearing Member Level 1 contact of the Payment Failure. The Clearing Member Level 1 contact shall, within a reasonable period of time, confirm the nature of the issue that caused the Payment Failure and, promptly upon providing such confirmation, proceed to provide the Corporation with the required information in accordance with the Operational Issue Resolution Notice defined below.

c) In the event that (i) the Clearing Member Level 1 contact fails to respond to the CDCC Level 1 contact within a reasonable period of time, (ii) the Clearing Member Level 1 contact cannot confirm the nature of the issue that caused the Payment Failure, or (iii) the information provided by the Clearing Member Level 1 contact regarding the nature of the Operational Issue that caused the Payment Failure is deemed unsatisfactory by the Corporation, the CDCC Level 2 contact shall immediately contact the Clearing Member Level 2 contact. The Clearing Member Level 2 contact shall, promptly upon being contacted in accordance with this subsection, proceed to provide the Corporation with the required information in accordance with the Operational Issue Resolution Notice defined below.

d) In the event that (i) the CDCC Level 2 contact fails to reach the Clearing Member Level 2 contact within a reasonable period of time, (ii) the Clearing Member Level 2 contact cannot confirm the nature of the Operational Issue that caused the Payment Failure, or (iii) the information provided by the Clearing Member Level 2 contact regarding the nature of the Operational Issue that caused the Payment Failure is deemed unsatisfactory by the Corporation, the CDCC Level 3 contact shall immediately contact the Clearing Member Level 3 contact. The Clearing Member Level 3 contact shall, within an hour after being contacted in accordance with this subsection, proceed to provide the Corporation with the required information in accordance with the Operational Issue Resolution Notice defined below.

ESCALATION PROCEDURE

2) Operational Issue Resolution Notice

a) Upon receiving notification by the Corporation of the Payment Failure in accordance with Section 1 of this Escalation Procedure, if the Clearing Member Level 1, 2, or 3 contact, as the case may be, confirms in accordance with Subsection 1 that the Payment Failure is solely due to an Operational Issue, such Clearing Member Level 1, 2, or 3 contact, as the case may be, shall provide the Corporation with a written confirmation of the nature of the Operational Issue that caused the Payment Failure and a detailed description of the steps proposed to be taken by the Clearing Member to resolve the Operational Issue (together, the "Operational Issue Resolution Notice"). Where the Operational Issue affects the Clearing Member's securities intermediary (including its Settlement Agent, Approved Depository or Approved Custodian), the Clearing Member shall immediately provide the Corporation with the contact details for the relevant representative of such securities intermediary's and include such representative in every communication with the Corporation related to the Operational Issue until the full resolution of the Operational Issue.

b) The Operational Issue Resolution Notice shall be re-issued by the Clearing Member Level 3 contact, to the Corporation on each day on which the Payment Failure persists, until there is a full resolution of the Operational Issue to the satisfaction of the Corporation.

3) Mitigation Tools

Immediately upon the occurrence of a Payment Failure, the Clearing Member shall use its best efforts to resolve the Operational Issue, and to mitigate the Payment Failure by the use of the following mitigation tools (the "Mitigation Tools") before 3:45 pm, where necessary:

a) The Exception Process Request after the start of CDS payment exchange, where applicable, or
b) The Payment Delay Request.

4) Delayed Resolution

On any Business Day on which an Operational Issue Resolution Notice remains in effect, in the event that the Corporation is of the view that the Operational Issue is expected, or likely, to persist until the next following Business Day,

a) The Corporation may determine that no Transaction shall be cleared by the Corporation for such Clearing Member until resolution; and

b) The Clearing Member Level 3 contact shall provide written confirmation that the Payment Failure is solely due to an Operational Issue and that the Clearing Member has used its best efforts to use the Mitigation Tools, and requests, if necessary, no later than 3:45 pm on the Business Day on which the first notification of the Payment Failure has been made, by a Payment Delay Request that the Corporation funds the Clearing Member's obligations of payment to the Corporation until the next following Business Day. The Clearing Member shall, upon request by the Corporation, represent and warrant to each of the Corporation's lender, acknowledging and confirming that each of the Corporation and the lender is relying on such representations and warranties without independent inquiry, that the Payment Failure is solely due to an Operational Issue and that no financial condition is affecting the Clearing Member in such a way that the provision of temporary funding in accordance with this section could jeopardize the interest of the Corporation or other Clearing Members. In the event that temporary funding is provided in accordance with this section, all fees and costs incurred by the Corporation in connection with such funding shall be added to and become part of the payment obligation owed by the Clearing Member to the Corporation and will become due immediately.

5) Non-Conforming

ESCALATION PROCEDURE

a) If no Mitigation Tool has been successfully implemented by the Clearing Member by the end of the Business Day on which the first notification of the Payment Failure has been made, the Corporation may declare the Clearing Member a Non-Conforming Member provided that the President & Chief Clearing Officer (or its designate) of the Corporation, prior to such designation, notifies the appropriate senior officer of the Bank of Canada in accordance with the Bank of Canada communication requirements.

b) If a Mitigation Tool has successfully been used by the Clearing Member but the Corporation is not satisfied with the information provided pursuant to the Operational Issue Resolution Notice, or considers that the steps proposed to be taken by the Clearing Member to resolve the Operational Issue expose the Corporation to an unacceptable level of risk, the Corporation may declare the Clearing Member a Non-Conforming Member, provided that the President & Chief Clearing Officer (or designate) of the Corporation prior to such designation notifies the appropriate senior officer of the Bank of Canada in accordance with the Bank of Canada communication requirements. The Corporation shall not exercise this discretion without having first performed the Escalation Procedure pursuant to Section 11 within a reasonable timeframe upon acquiring actual knowledge or confirmation of a Payment Failure by a Clearing Member and will not exercise this discretion before 10:00 am on the day following the receipt of the Level-3 Operational Issue Resolution Notice, unless the Clearing Member has not confirmed that the Payment Failure results from an Operational Issue.

CANADIAN DERIVATIVES CLEARING CORPORATION
CORPORATION CANADIENNE DE COMPENSATION DE PRODUITS DÉRIVÉS

OPERATIONS MANUAL

TABLE OF CONTENTS

PREAMBLE AND DEFINITIONS

PREAMBLE

This Amended and Restated Operations Manual cancels and supersedes the previous versions thereof.

CDCC and its Clearing Members are contractually bound by the Membership Agreement which is constituted by the Application for Membership when accepted by CDCC, as may be amended from time to time, which incorporates by reference the Rules of CDCC, as may be amended from time to time. The Rules of CDCC include this Operations Manual, as may be amended from time to time. In the case of conflict, the provisions of the Rules (excluding the Operations Manual) prevail over this Operations Manual. The provisions of the Rules (including this Operations Manual), in the case of conflict, prevail over the provisions of the Application for Membership.

The Operations Manual provides practical details with respect to (i) certain definitions, (ii) timelines, (iii) reports, (iv) trade processing, (v) open positions, (vi) exercises, tenders, assignments and delivery, (vii) settlement, (viii) additional margin processing, and (ix) clearing fees. The Operations Manual contains two schedules which are integral parts thereof: (a) the Risk Manual providing practical details with respect to margin and other risk management processes, including the Default Manual as an Appendix, and (b) the templates of depository agreements.

All times specified in this Operations Manual refer to Eastern Time, unless otherwise indicated.

All amounts specified in this Operations Manual refer to Canadian currency, unless otherwise indicated.

All capitalized terms used in this Operations Manual shall have the meanings assigned to them in the Rules unless the context otherwise requires or unless specifically defined differently herein.

DEFINITIONS

"Automatic Exercise" – a process by which CDCS will exercise In-the-Money Options at a pre-determined threshold.

"**CDCC Clearing Application**" – CDCS and all the processes associated with it, as may be supplemented or otherwise changed from time to time.

"Closing Transaction" – any Transaction that is either a Closing Buy Transaction, a Closing Purchase Transaction, a Closing Sell Transaction or a Closing Writing Transaction, as such terms are defined in the Rules, and in all cases that reduces or eliminates the Clearing Member's Open Interest.

"*Converge*" – marketing brand of the portion of the CDCC Clearing Application that captures and processes OTCI Transactions, including Fixed Income Transactions.

"Eligible Collateral" – collateral which may be deposited with the Corporation for the purpose of fulfilling Margin requirements and which meets certain criteria described in the Risk Manual.

"Exerciser" – a Clearing Member that holds a Long Position in a particular Series of Options and submits an Exercise Notice to CDCC.

"Expiry Friday" – the third Friday of the month, unless that Friday is not a Business Day, then the Business Day preceding the third Friday of the month.

"FIFO Period" – the quarterly delivery period for Futures contracts on Government of Canada bonds, in accordance with Contract Specifications of the relevant Exchange.

“Forward Repurchase Transaction” – a Repurchase Transaction in respect of which the Open Leg has not settled yet at the time of the relevant report.

“FTP Downloads” – Clearing Member’s access to files and reports on an FTP server that is part of the CDCC Clearing Application.

“Inquiry Screen” – Graphical User Interface (GUI) view of the CDCC Clearing Application.

“Large Value Transfer System” or “LVTS” – an electronic wire system introduced by the Canadian Payments Association in February 1999 to facilitate the transfer of irrevocable payments in Canadian dollars across the country.

“Limited Clearing Member (LCM)” – has the meaning given thereto in Section A-102 of the Rules.

“Margin Fund Account” – the CDCS record provided to each Clearing Member containing all Margin deposited by such Clearing Member to CDCC, in respect of any of the following: (1) Base Initial Margin (or Adjusted Base Initial Margin, as the case may be), (2) Additional Margin for Market Liquidity Risk, (3) Additional Margin for Specific Wrong-Way Risk, (4) Additional Margin for Mismatched Settlement Risk, (5) Additional Margin for Intra-Day Variation Margin Risk, (6) Additional Margin for Unpaid Option Premium Exposure Risk, (7) Additional Margin for Banking Holiday Risk, (8) Additional Margin for Variation Margin Delivery Risk, (9) Additional Capital Margin Risk, (10) Additional Margin for Uncovered Risk of Limited Clearing Members, , (11) Variation Margin for Options, and (12) Variation Margin for Unsettled Item; the whole in accordance with the Risk Manual, or otherwise as set forth in Section 8-1 hereof.

“Mini Futures Contract” – a Future that has the same Underlying Interest as a Standard Futures Contract but having a Unit of Trading that is a ratio of the Standard Futures Contract in accordance with applicable Contract Specifications.

“Net Settlement Position” – all the future Net Delivery Requirements and Net Payment Against Delivery Requirements of a Clearing Member, as reported by CDCC on a daily basis, taking into account all Fixed Income Transactions that have settled during the day and all new Fixed Income Transactions that have been novated to CDCC.

“Net Variation Margin Requirement” – has the meaning given thereto in Section D-601 of the Rules. Reference will be made to (Fixed Income) Net Variation Margin Requirement in this Manual.

“Open Position File” – database of the CDCC Clearing Application which compiles the Open Positions of all Clearing Members. Each Clearing Member can access the information pertaining to his accounts only, not to other Clearing Members’ accounts.

“Opening Transaction” – any Transaction that is either an Opening Buy Transaction, an Opening Purchase Transaction, an Opening Sell Transaction or an Opening Writing Transaction as set forth in Section A-102 of the Rules.

“Operational Notices” – formal notifications to the Clearing Members, representing items that are not published on CDCC’s website. These documents are available on the Secured Website.

“OTCI Equity Options” – over the counter options on an equity, bearing characteristics that differ from Exchange traded Options and are cleared by CDCC through *Converge.*

PREAMBLE AND DEFINITIONS

“Position Transfer” – this is the CDCC Clearing Application function to move a position from one Clearing Member to another.

“Production Schedule” – all of the time lines that are followed by CDCC, as set forth in Section 2 of this Operations Manual.

“Request for Standard vs Mini Offset” – the request by a Clearing Member, in the form prescribed by CDCC, to offset one (1) or more Long Position(s) on a Standard Futures Contract against the equivalent number of Short Positions on the corresponding Mini Futures Contract (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract), having the same Delivery Month and booked in the same Clearing Member’s account, or the other way around.

“Running Repurchase Transaction” – a Repurchase Transaction in respect of which the Open Leg has already settled at the time of the relevant report.

“Secured Website” – Clearing Members only secured web site that requires a sign on and password, where CDCC publishes Operational Notices as well as documents that are meant only for the Clearing Members.

“Specific Deposit” – a Put Escrow Receipt, a Call Underlying Interest Deposit or a Futures Underlying Interest Deposit which are accepted by CDCC as Underlying Interest Equivalent to cover a specific Short Position.

“Standard Futures Contract” – a Future in relation to which a Mini Futures Contract exists.

“Tenderer” – a Clearing Member that holds a Short Position in a particular Series of Futures and submits a Tender Notice, or is deemed to do so in accordance with the Rules, to CDCC.

“**Unsettled Item**” – any delivery of the Underlying Interest that has not been settled at the Central Securities Depository.

“(Fixed Income) Variation Margin Account” – the CDCS record provided to each Clearing Member containing all Margin deposits made by such Clearing Member to CDCC for (Fixed Income) Net Variation Margin Requirement purposes only, in accordance with Section D-607 of the Rules, or otherwise as set forth in Section 8-1 hereof.

“**Weekly Options**” – Options that expire on any Friday, other than Expiry Friday. Only monthly Options expire on Expiry Friday.

TIME FRAMES

ON-LINE ACCESS

Each Clearing Member must be connected to the CDCC Clearing Application using its PC terminals to perform a variety of functions. (Clearing Members must supply their own PC terminals and Internet connection, at their own cost).

All instructions (corrections, Open Position changes, Position Transfers, Deposits, withdrawals, and submission of Exercise Notices and Tender Notices) must be entered on-line.

The CDCC Clearing Application allows Clearing Members to view their current information throughout the day electronically (except during scheduled maintenance or unforeseen outages). In addition, Clearing Members can download their reports after 7:00 p.m. every day using the FTP Download function.

Should a Clearing Member not have electronic access (due to technical issues) to the CDCC Clearing Application during Office Hours, CDCC can perform instructions on behalf of the Clearing Member. This requires a phone call from the Clearing Member to CDCC, along with the appropriate form faxed or scanned and e-mailed to CDCC. Such form must be authorized with the approved Clearing Member's stamp.

With respect to operational activity related to Options with an Expiration Date on Expiry Friday, CDCC staff members are on-site from 7:00 a.m. to forty-five (45) minutes after delivery of the Options Exercised and Assigned Report (MT02).

TIME FRAMES

SETTLEMENT TIME FOR EVERY BUSINESS DAY

Activity	Time Frames	Activity Type
Start of Settlement Day at CDS and Clearing Day at CDCC	5:30 a.m.	System Activity
Clearing Member's (excluding LCMs) Early Morning Intra-Day Margin Calculation & Notification	7:15 a.m.	System Activity/Notification
Deadline to settle Early Morning Intra-Day Margin Call for Clearing Members (excluding LCMs)	1 hour after notification	Obligation Deadline
Assets Concentration Limits breach notification	7:30 a.m.	Notification
Deadline for Clearing Members (excluding LCMs) for Settlement Time with respect to payments for overnight settlement	7:45 a.m.	Obligation Deadline
Fixed Income Transactions – Netting Cycle Timeframe in respect of any Pending Settlement Requirements – 15 minutes cycle	8:30 a.m.	System Activity
Deadline for Clearing Members (excluding LCMs) to receive EOD Amount due from CDCC	8:45 a.m.	Obligation Deadline
Deadline for LCMs for Settlement Time with respect to payments for overnight settlement	9:00 a.m.	Obligation Deadline
Fixed Income Transactions – Morning Netting Cycle Timeframe in respect of any Pending Payment Against Delivery Requirements (Morning Net Payment Against Delivery Requirements sent to CDS for settlement during the Morning Net DVP Settlement Timeframe) – 15 minutes cycle	10:00 a.m.	System Activity
Morning Net DVP Settlement Calculation	10:15 a.m.	System Activity
Deadline for Morning Net DVP Settlement	10:30 a.m.	Obligation Deadline
Clearing Member's (excluding LCMs) Morning Intra-Day Margin Calculation & Notification	10:30 a.m.	System Activity/Notification
Deadline to settle Morning Intra-Day Margin Call for Clearing Members (excluding LCMs)	1 hour after notification	Obligation Deadline
Assets Concentration Limit breach correction deadline	11:45 a.m.	Obligation Deadline

SETTLEMENT TIME FOR EVERY BUSINESS DAY (continued)

Activity	Time Frames	Activity Type
Fixed Income Transactions – Netting Cycle Timeframe in respect of any Pending Settlement Requirements – 15 minutes cycle	12:15 p.m.	System Activity
Clearing Member's Afternoon Intra-Day Margin Calculation & Notification	12:45 p.m.	System Activity/Notification
Deadline to settle Afternoon Intra-Day Margin Call for Clearing Members (excluding LCMs)	1 hour after notification	Obligation Deadline
Specific Deposits (same day withdrawal)	12:45 p.m.	Operational Deadline
Deadline to settle Intra-Day Margin Call and Additional Margins for LCMs	The later of 2:45 p.m. or 2 hours after notification	Obligation Deadline
Fixed Income Transactions – Netting Cycle Timeframe in respect of any Pending Settlement Requirements – 15 minutes cycle	2:00 p.m.	System Activity
Cash Deposits (Margin deposits) – $10,000,000 and under (same day deposit)	2:45 p.m.	Operational Deadline
Cash Deposits (Margin deposits) – over $10,000,000 (2 Business Days notice)	2:45 p.m.	Operational Deadline

SETTLEMENT TIME FOR EVERY BUSINESS DAY (continued)

Activity	Time Frames	Activity Type
Cash withdrawal requests (Margin deposits) – $10,000,000 and under (same day withdrawal)	2:45 p.m.	Operational Deadline
Cash withdrawal requests (Margin deposits) – over $10,000,000 (2 Business Days notice)	2:45 p.m.	Operational Deadline
Fixed Income Transactions – (Same Day Transactions) – Submission Cut-Off Time	3:30 p.m.	Operational Deadline
Clearing Members (excluding LCMs) - All assets deposits other than cash (Margin deposits)	3:30 p.m.	Operational Deadline

TIME FRAMES

Clearing Members - All assets withdrawal requests other than cash (Margin deposits) for same day withdrawal	3:30 p.m.	Operational Deadline
Clearing Members - All assets substitution requests other than cash (Margin deposits) for same day substitution	3:30 p.m.	Operational Deadline
Fixed Income Transactions – Afternoon Netting Cycle Timeframe in respect of any Pending Settlement Requirements (Afternoon Net DVP Settlement Requirements sent to CDS for settlement by End of Day DVP Settlement Time) – 5 minutes cycle	3:35 p.m.	System Activity
CDS Payment Exchange, Net Wire Payment	4:00 p.m.	System Activity
End of Day DVP Settlement Time	4:00 p.m.	Obligation Deadline
Unsettled Item (Options Underlying deliveries only): Confirmation of settled items to be sent to CDCC	4:15 p.m.	Operational Deadline
Deadline for CDCC to respond to substitution or withdrawal request (other than (Fixed Income) Variation Margin)	4:30 p.m.	Obligation Deadline
OTCI (other than Fixed Income Transactions) – Trade Submission Deadline	4:30 p.m.	Operational Deadline
Projected Margin Report Computation	4:30 p.m.	System Activity
Futures – Request for Standard vs Mini Offset	5:00 p.m.	Operational Deadline
Position Transfers	5:25 p.m.	Operational Deadline
Same Day and T+1 Trade corrections	5:30 p.m.	Operational Deadline

SETTLEMENT TIME FOR EVERY BUSINESS DAY (continued)

Activity	**Time Frames**	**Activity Type**
Open Position changes	5:30 p.m.	Operational Deadline
Futures – Tender Notices submission	5:30 p.m.	Operational Deadline
Options – Exercise Notices submission	5:30 p.m.	Operational Deadline
Fixed Income Transactions and Futures contracts on Acceptable Securities – Netting Cut Off Time (Netted settlement instructions (Net Delivery Requirements and Net Payment Against Delivery Requirements) sent to CDS for settlement on the next business day)	5:30 p.m.	System Activity

TIME FRAMES

CDCC Clearing Application shutdown – Close of Business	5:30 p.m.	System Activity
FIFO: Daily reporting by Clearing Members of the Long Positions in each of their accounts in chronological order	5:30 p.m.	Operational Deadline
FIFO: Submission of Tender Notices	5:30 p.m.	Operational Deadline
LCM Only - All assets deposits other than cash (in respect of all Margin requirements)	6:30 p.m.	Operational Deadline
Fixed Income Transactions – available (next Business Day start)	7:00 p.m.	System Activity

TIME FRAMES

SETTLEMENT TIME FOR (FIXED INCOME) VARIATION MARGIN FOR EVERY BUSINESS DAY

Activity	Time Frames	Activity Type
Deadline to deliver securities to CDCC to settle Net Variation Margin Requirement	9:30 a.m.	Obligation Deadline
Deadline to submit to CDCC a (Fixed Income) Buy-In request for same day settlement	10:00 a.m.	Operational Deadline
Deadline to deliver securities to Clearing Members by CDCC to settle (Fixed Income) Variation Margin amount	10:30 a.m.	Obligation Deadline
Deadline to submit substitutions for same day settlement	11:00 a.m.	Operation Deadline
Deadline for CDCC to submit substitution instructions to Clearing Members for same day settlement	12:00 (noon)	Operational Deadline
Deadline to deliver same day settlement substitution to CDCC	3:00 p.m.	Obligation Deadline
Deadline for CDCC to deliver same day substitutions For (Fixed Income) Variation Margin	4:00 p.m.	Obligation Deadline
EOD Net Variation Margin Requirement Computation	4:30 p.m.	System Activity

TIME FRAMES

SETTLEMENT TIME FOR MONTHLY EXPIRY

Activity	Time Frames	Activity Type
Reports available (FTP Download): ➢ Expiry Report (MX01) ➢ Expiry Options Daily Transaction Report (MT01) ➢ List of Options/Cash Adjustments (MT03)	7:15 p.m.	Publication
CDCC Clearing Application available for: ➢ Trade corrections ➢ Open Position changes ➢ Position Transfers ➢ Changes to Automatic Exercises ➢ Exercise Notices input ➢ Cancel / correct Friday's exercises	7:15 to 10:15 p.m.	Operational Deadline
CDCC Clearing Application shutdown: ➢ CDCC processes expiry entries	10:15 p.m.	Operational Deadline
Reports available (FTP Download): ➢ List of Expiry Adjustments Report (MX02) ➢ Expiry Difference Report (MX03)	10:30 p.m.	Publication
CDCC Clearing Application available again for: ➢ Review of expiry entries ➢ Corrections to expiry entries	10:30 to 10:45 p.m.	Operational Deadline
CDCC Clearing Application shutdown ➢ Close of Business	10:45 p.m.	Operational Deadline
Reports available (FTP Download): ➢ Options Exercised and Assigned Report (MT02) ➢ Other reports and files also available	12:30 a.m.	Publication

TIME FRAMES

SETTLEMENT TIME FOR WEEKLY EXPIRY

Activity	Time Frames	Activity Type
CDCC Clearing Application available for: ➢ Trade corrections ➢ Open Position changes ➢ Position Transfers ➢ Changes to Automatic Exercises	7:00 to 8:00 p.m.	Operational Deadline
CDCC Clearing Application shutdown: ➢ Close of Business	8:00 p.m.	Operational Deadline
Reports available (FTP Download): ➢ Options Exercised and Assigned Report (MT02) ➢ Other reports and files also available	9:45 p.m.	Operational Deadline

TIME FRAMES

ADDITIONAL NET DVP SETTLEMENT PROCESS

In respect of any Pending Payment Against Delivery Requirements at the Netting Cycle Timeframe(s) specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Net Payment Against Delivery Requirements) to the Central Securities Depository reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member.

CDCC-REPORTS

REPORT REFERENCES

Clearing Member reports contain the following information:

Transactions	Reports relating to Clearing Member’s Transactions such as trade entries, trade corrections, trade rejections and exercises/tenders. These reports start with the alpha code MT.
Fees	Report relating to the collection of service fees from the Clearing Member. These reports start with the alpha code MB.
Settlements	Reports relating to Premiums, Settlement of Gains and Losses, and Margin. These reports start with the alpha code MS.
Assets	Reports relating to the maintenance of Clearing Member’s assets as well as depository information. These reports start with the alpha code MA.
Delivery	Reports relating to delivery obligations and unsettled deliveries. These reports start with the alpha code MD.
Positions	Reports relating to positions held by Clearing Members separately for Futures, Options, OTCI and Fixed Income Transactions. These reports start with the alpha code MP.
Expiry	Reports used by Clearing Members to verify expiring positions and automatic exercises. These reports start with the alpha code MX.
Risk	Reports relating to risk management. These reports start with the alpha code MR.

CDCC-REPORTS

REPORT DETAILS

Report Code	Report Name	Report Description
Daily:		
MA01	Deposits and Withdrawals Report	Details on Clearing Member's deposits and withdrawals for Margin Fund Account, Clearing Fund and (Fixed Income) Variation Margin Account. (**Note**: will find the letters D, W and PW next to the date of deposit)
MD01	Options Unsettled Delivery Report	Lists unsettled deliveries for Options.
MD51	Futures Unsettled Delivery Report	Lists unsettled deliveries for Futures (does not include Share Futures) - the issue and number of Futures contracts which must be delivered - the account to which the delivery has been assigned and the opposite Clearing Member - the Settlement Amount and settlement date
MD52	Share Futures Unsettled Delivery Report	Lists unsettled deliveries for Share Futures (SF) - the issue and number of SF contracts which must be delivered - the account to which the delivery has been assigned and the opposite Clearing Member - the Settlement Amount and settlement date
MD70	Fixed Income Net Settlement Delivery Status Report	Status of Clearing Member's settlement activity at the Central Securities Depository with respect to Acceptable Securities on that day.
MD71	Settlement Obligation Calculated Amounts Reports	Provide information on each Settlement Instruction produced at the exit of the Intra-Day netting that is being considered in the PITSO.
MD72	Settlement Obligation Fulfillment	Provide the different settlement instruction status changes during the PITSO. The report is separated in three sections: Settlement, Pending Party At Fault and Cancelled.
MP01	Options Open Positions Report	Lists the Clearing Member's Open Positions for puts and calls.
MP02	Sub-Account Options Open Positions Report	Lists all Options Open Positions in sub-accounts of the Clearing Member's Client Account(s), Firm Account(s) and Multi-Purpose Account(s).
MP21	Contract Adjustment Report	Lists the Clearing Member's Long Positions and Short Positions before and after the relevant contract adjustment.
MP51	Futures Open Positions Report	Lists the Clearing Member's Futures and Options on Futures Open Positions for all accounts.
MP70	Fixed Income Forward Repo Position Report	Lists the Clearing Member's Repurchase Transactions accepted for clearing by CDCC.
MP71	Fixed Income Repo Conversion Position Report	Lists all of the Clearing Member's Repurchase Transactions that have progressed from Forward Repurchase Transactions to Running Repurchase Transactions on that day.
MP73	Fixed Income Running Repo Open Positions Report	Lists all of the Clearing Member's Running Repurchase Transactions as of that day.
MP75	Fixed Income Forward Net Settlement Positions Report	Lists all of the Clearing Member's forward Net Settlement Positions obligations.
MP79	Daily Repo Rate Mark to Market Report	Lists the Clearing Member's Repo Rate Requirements,

CDCC-REPORTS

MS01	Daily Settlement Summary Report	Lists assets balances with Margin requirements and cash settlement in Canadian and U.S. dollars.
MS06	Total Margin Requirement Report	Total margin requirement report with breakdown by margin categories, account types (Firm, Client, Multipurpose) and sub-accounts
MS07	Intra-Day Margin Report	Margin call details with Margin requirements by account.
MS08	Daily Margin Activity Report	Lists details of positions by Class Group with Margin requirements.
MS10	Variation Margin Summary Report	Lists the details of the Fixed Income Clearing Member's Variation Margin activities and suggests securities to return if applicable.
MS70	Fixed Income Net Settlement Position Activity Report	Lists all of the Clearing Member's Fixed Income Transactions activities that contribute to its Net Settlement Position.
MS73	Entitlement Report	Lists all Fixed Income Clearing Member's coupon payments.
MS75	Fixed Income End of Day Settlement Instruction Report	Detail of Clearing Member's net settlement instructions to be sent to the Central Securities Depository after Netting Cut-Off Time.
MS77	Net Payment Against Delivery Requirement	Provide information at the sub-account level on settlements that occurred during the PITSO.
MS78	Forward NSP & Settlement Instruction Reconciliation Report	Information report containing Net Settlement Position information for the use of Clearing Member for reconciliation.
MT01	Options Daily Transaction Report	Lists details for all Option contracts from previous Business Day.
MT02	Options Exercised and Assigned Report	Lists totals for Options Exercised Positions and Assigned Positions by Series of Options (including the debit and credit dollar values of the Transactions).
MT03	List of Options/Cash Adjustments Report	Lists all trade adjustments and Open Position changes including cash adjustments and Position Transfers.
MT05	Options Consolidated Activity Report	Lists all positions with activity including Option Premiums.
MT06	Options Sub-Account Consolidated Activity Report	Lists positions with activity including Option Premiums for only the sub-accounts of Client, Firm and Multi-Purpose.
MT10	Unconfirmed Items Report	Lists all items that remained unconfirmed by the opposite member at the end of the current Business Day.
MT29	Trades Rejection Modification Report	Lists all original and modified trade rejections for the Clearing Member.
MT51	Final Futures Daily Transaction Report	Lists trade details for all Futures and Options on Futures activity.
MT52	Futures Tenders and Assignments Report	Lists all Tender Notices and Assigned Positions details.
MT53	List of Futures/Cash Adjustments Report	Lists details on all Futures and Options on Futures trade adjustments, Open Position changes, including cash adjustments and Position Transfers.
MT54	Futures Trading Summary Report	Lists all Series of Futures and Options on Futures and prices, and volumes at which each were traded. Lists number of contracts bought and sold for each Series of Futures Trade Prices.
MT60	Share Futures Tender and Assigned Report	Lists totals for Share Futures (SF) tendered and assigned positions including the debit and credit dollar values of the transactions.
MT66	Futures Sub-Account Consolidated Activity Report	Lists Futures and Options on Futures positions with activity including Settlement of Gain and Losses and Futures Premiums respectively, for the sub-accounts of Client, Firm and Multi-Purpose.
MT70	Fixed Income Novated	Lists the Clearing Member's daily Fixed Income Transactions

	Transactions Report	novated to CDCC in accordance with the CDCC Clearing Application.
MT71	Fixed Income CSD Novated Trades Report	Lists the data transmitted to CDCC by the Central Securities Depository with respect to the Clearing Member's daily Fixed Income Transactions submitted for clearing.
MT73	Fixed Income Trade Rejection Report	Lists details of Clearing Member's daily Fixed Income Transactions that were rejected (DK) by CDCC or by the Clearing Member itself.
MT74	Fixed Income Not-Novated Transactions Report	Lists the Clearing Member's daily Fixed Income Transactions that were not novated to CDCC, including all rejected and orphaned trades.
MT92	Options on Futures Exercised & Assigned Report	Lists totals for Options on Futures Exercised Positions and Assigned Positions by Series. **Note**: Futures Options Exercised Positions and Assigned Positions value is nil
MT99	Detailed Futures Consolidated Activity Report	Detailed list of all Futures position with activity, including Settlement of Gains and Losses. Detailed list of all Options on Futures positions and activity including Futures Premiums.
Monthly:		
MA71	Clearing Fund Statement (monthly and intra-monthly)	Identifies the Clearing Member's (excluding LCM) Clearing Fund obligation. Lists the Clearing Member's (excluding LCM) current Deposits within the Clearing Fund and what is owed.
MB01	Monthly Clearing Fees Invoice	This report contains summarization of the monthly clearing fees in an invoice format – THIS IS NOT TO BE PAID. The system automatically includes the collection of the fees within the daily settlement on the morning of the fifth business day of the month.
MB02	Monthly Clearing Fees Details Report	This report contains the following four sub-reports: ''Fees'' – this is product by sub-account. ''Summary by Category'' – this is summarization by product. "Sub-Account Summary" – this is a summary of the operational charges by sub-account irrespective of product. ''Summary by Account Operation Type'' – this is a summary of the operational charges by sub-account.
MB03	Monthly Fixed Income Clearing Fees Invoice	This report details the clearing fees that are due with respect to Fixed Income Transactions by each Clearing Member.
MT40	Broker Ranking by Account Report	Individual Clearing Member ranking within CDCC for contracts, value traded and transactions (trade only) by month with year to date.
FIFO Period:		
MP56	FIFO Position Report	Lists Series of Futures with positions in chronological order, contracts in positions.
MP60	FIFO Declaration vs. Open Position Report	Lists Clearing Member's Futures positions and FIFO long positions declaration.
Options on Futures Expiry:		
MT51	Final Futures Daily Transaction Report	Lists trade details for all Futures and Options on Futures activity.
MX11	Futures Options Expiry Report	Lists all expiring Options on Futures with In-the-Money Options or Out-Of-the-Money Options amounts and Automatic Exercise positions for Expiry.
MX12	Futures Options Expiry Adjustments Report	Lists all trade adjustments and Open Positions changes on expiring Series only.
MX13	Futures Options Expiry	Lists all reported changes, deletions and/or additions to exercises on

	Difference Report	the Futures Options Expiry Report (MX11).
Options Expiry (Friday Evening):		
MT01	Options Daily Transaction Report	Lists trade details for all expiring Option contracts for the Business Day.
MT02	Options Exercised and Assigned Report	Lists totals for Options Exercised Positions and Assigned Positions by Series of Options (including the debit and credit dollar values of the transactions).
MX01	Expiry Report	Lists all expiring Options with In-the-Money Options or Out-of-the-Money Options amounts and Automatic Exercise positions for Expiry.
MX02	List of Expiry Adjustments Report	Lists all trade adjustments and Open Positions changes on expiring Series of Options only.
MX03	Expiry Difference Report	Lists all reported changes, deletions and/or additions to exercises on the Expiry Report.
OTCI Expiry:		
MX01	Expiry Report	Lists all expiring Options with In-the-Money Options or Out-of-the-Money Options amounts and Automatic Exercise positions for Expiry.
Business Day following Expiry:		
MP11	Expired Options Positions Report	Lists the Clearing Member's balance of expired Options positions following the Friday Expiry process.
MP12	Expired Futures Options Positions Report	Lists the Clearing Member's balance of expired Futures Options positions following the Friday Expiry process.

TRADE PROCESSING

INTRODUCTION

All Exchange Transactions are processed electronically. In all cases both the selling and buying trade data is sent to the relevant Exchange's electronic trading system, which then transmits the matched trades to CDCC. The CDCC Clearing Application verifies the trade information and, if incorrect, rejects it for correction and resubmission. If the trade information is valid, the Clearing Member's Open Positions are immediately updated. The Exchange Transaction is reported on the Options Daily Transaction Report (MT01) or on the Final Futures Daily Transaction Report (MT51), as the case may be.

OTCI Transactions (other than Fixed Income Transactions) are also submitted electronically. Clearing Members submit their individual trade details onto the trade capture screens of Converge, which will match, validate and confirm the transactional details to the submitting Clearing Members. OTCI Options are reported on the Options Daily Transaction Report (MT01). No corrections will be permitted for OTCI Transactions after CDCC issues a Trade Confirmation.

Fixed Income Transactions will be transmitted through the CDS trade matching facility routing matched trades to CDCC.

Fixed Income Transactions are reported on the Fixed Income CSD Information Report (MT71).

The reports referred to herein are available for FTP Downloads on the morning of the Business Day after Transactions are submitted for clearing to CDCC. In accordance with the Rules, Clearing Members must verify that such reports are correct.

TRADE PROCESSING

EXCHANGE TRANSACTIONS (OPTIONS AND FUTURES)

Positions of each Clearing Member are carried by CDCC for Client Account(s), Firm Account(s) and Multi-Purpose Account(s), each of which is maintained separately. CDCC supplies reports for each account.

Such separation requires that each Clearing Member designate whether a Transaction is submitted for a "Client", "Firm" or "Multi-Purpose" when submitting a Transaction for clearing. Furthermore, if separate sub-accounts are maintained for each account type, each Transaction must be coded to indicate the appropriate sub-account information.

It is required that a Closing Transaction for a Client Account be designated as such on the trade input. Such designation is not required for a Netted Client Account, a Multi-Purpose Account or a Firm Account, as CDCC carries net position records in the Open Position File for each of these accounts.

All Transactions for a Client Account which are not specifically designated as Closing Transactions shall be processed by CDCC as Opening Transactions. Opening Purchase Transactions increase the Long Position and Opening Writing Transactions increase the Short Position, in the particular Series of Options involved, as reported in the Clearing Member's Client Account. Opening Buy Transactions increase the Long Position and Opening Sell Transactions increase the Short Position, in the particular Series of Futures involved, as reported in the Clearing Member's Client Account.

Conversely, all Transactions designated as Closing Transactions decrease the Short Position and Long Position, respectively, for the particular Series of Options or Series of Futures in the reporting Clearing Member's Client Account. The CDCC Clearing Application verifies that all the Closing Transactions are valid and if the volume of a Closing Transaction exceeds the Open Position, the CDCC Clearing Application will reject it and replace it by an Opening Transaction for the entire volume.

The designation of a Transaction as "opening" or "closing" can be modified by the Close of Business.

CDCC maintains both the Long Position <u>and</u> the Short Position for each Series of Options and Series of Futures for Client Accounts but only maintains a net Long Position <u>or</u> net Short Position for each Series of Options and Series of Futures for Netted Client Accounts, Multi-Purpose Accounts and Firm Accounts.

TRADE PROCESSING

FIXED INCOME TRANSACTIONS

Positions of each Clearing Member are carried by CDCC for Client Account(s), Firm Account(s) and Multi-Purpose Account(s), each of which is maintained separately. CDCC supplies reports for each account.

Such separation requires that each Clearing Member designate whether a Transaction is submitted for a "Client", "Firm" or "Multi-Purpose" when submitting a Transaction for Clearing. Furthermore, if separate sub-accounts are maintained for each account type, each Transaction must be coded to indicate the appropriate sub-account information.

All Repurchase Transactions and Cash Buy or Sell Trades must be submitted for clearing to CDCC through the CDS trade matching facility routing matched trades to CDCC.

Once a Repurchase Transaction or Cash Buy or Sell Trade is received by CDCC, a variety of validations will occur. These validations ensure that all transactional details match and CDCC does not accept any Repurchase Transaction or Cash Buy or Sell Trade bearing attributes that are not acceptable for clearing.

Upon issuance of a Trade Confirmation by CDCC, the Repurchase Transaction or Cash Buy or Sell Trade is novated to CDCC, such that the original Repo or Cash Buy or Sell Trade between the two Fixed Income Clearing Members is cancelled and replaced by two equivalent Fixed Income Transactions, one between the Seller and CDCC and one between the Buyer and CDCC.

OPEN POSITIONS

INTRODUCTION

Having accepted a Transaction, the next step in the CDCC Clearing Application is the determination of the Open Position. Each Clearing Member can view all the information related to their accounts on the Open Position File which records the open Long Position and Short Position for each Series of Options and Series of Futures, OTCI and Fixed Income Transactions for each account type, updating the information as each Transaction is accepted.

Each Clearing Member is responsible for reconciling the information recorded on the Open Position File and all relevant reports issued by CDCC against their internal records. Careful attention must be paid to account designation and whether the Transaction is coded as “opening” or “closing” in the relevant file or report. Reports are available for FTP Download as per Section 2 of this Operations Manual.

Open Interest is updated automatically as each Transaction, Exercise Notice and Tender Notice is processed.

ADJUSTMENTS OF OPEN POSITIONS

GENERAL

Occasionally the need will arise to adjust an already processed Transaction. In such cases, the adjustment will affect the Clearing Member's Open Position accordingly. For example, an adjustment designed to change the original Opening Buy Transaction (or Opening Purchase Transaction) to a Closing Buy Transaction (or Closing Purchase Transaction) will result in a decrease in the Long Position in the Series of Futures or Series of Options by the volume of the original Transaction. Any Settlement of Gains and Losses (or Premium) adjustments will be shown as adjustments on the relevant report.

Generally this situation will occur when:

1. The transactional details were incorrectly recorded, e.g. Clearing Member number, price, series and volume.

2. Information pertaining to only one side of the Transaction such as the opening/closing or account designation was erroneously reported on the original trade.

3. The source document of the relevant Exchange was input incorrectly.

4. Transfer of Open Positions from one account to another account of a Clearing Member.

5. Transfer of Open Positions from an account of one Clearing Member to an account of another Clearing Member.

Types of Adjustments

The following adjustments are acceptable for Exchange Transactions and OTCI (other than Fixed Income Transactions):

1. <u>Same Day Trade Corrections (T)</u>. Same day trade corrections are only permitted on account type, sub-account designation and opening/closing and no corrections are permitted on OTCI Transactions after a Trade Confirmation has been issued by CDCC.

2. <u>Trade Date + 1 Corrections (T+1)</u>. Modifications of any type are subject to approval by the relevant Exchange and no corrections permitted on OTCI Transactions.

OPEN POSITIONS

3. Open Position Changes. For OTCI Transactions, these will be performed through the Position Transfer function of the CDCC Clearing Application. Note: there is a Position Transfer fee per contract.

4. Position Transfers. Specific function of the CDCC Clearing Application to move positions from one Clearing Member to another or between accounts of a same Clearing Member on a post trade basis. Note: there is a Position Transfer fee per contract.

5. Standard vs Mini Offset. Upon the receipt of a Request for Standard vs Mini Offset in the prescribed form, CDCC will offset (i) one or more existing Standard Futures Contract Long Position(s) against the equivalent number of existing Mini Futures Contract Short Positions (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract) having the same Delivery Month and booked in the same Clearing Member's account, or (ii) a number of existing Mini Futures Long Positions against one or more Standard Futures Short Position(s) (totalling the same quantity of the Underlying Interest in accordance with the ratio prescribed in the Contract Specifications of the Mini Futures Contract) having the same Delivery Month and booked in the same Clearing Member's account, based on the instructions provided in the Request for Standard s Mini Offset. Such Long Positions and Short Positions shall be offset at the previous day's Settlement Price, with the effect of reducing the Open Positions that the Clearing Member has on the relevant Series of Futures in the relevant account.

Conditions applicable to adjustments:

If there are any adjustments that affect another Clearing Member (on the opposite side of the original Transaction), both Clearing Members must come to an agreement as to the adjustments to be implemented. If one Clearing Member does not enter any changes through the CDCC Clearing Application, the Transaction will stay as is with respect to both Clearing Members.

Notification of all adjustments must be completed prior to the time specified in Section 2 of this Operations Manual. All completed adjustments are processed when they have been verified and validated by CDCC.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

INTRODUCTION

OPTIONS

At the time of exercise of an Option, CDCC is responsible for issuing settlement records that will facilitate the delivery of the Underlying Interest to the Clearing Member who chooses to exercise that Option (in case of the exercise of a call Option) or the payment of the relevant Exercise Price (in the case of the exercise of a put Option). When a Clearing Member exercises an Option, CDCC assigns the delivery obligation to a Clearing Member who is the writer of Options in the same Series of Options in any one of its Client Account(s), Firm Account(s), or Multi-Purpose Account(s).

Assignment is made specifically to one of these accounts by CDCC. If assignment is made to a Client Account, the Clearing Member is responsible for allocating it to a specific client. If assignment is made to a Multi-Purpose Account, the Clearing Member must allocate it to the specific Multi-Purpose Account designated by CDCC.

Delivery of the Underlying Interest and payment of the Exercise Price is to be effected by Clearing Members through the settlement method instructed by CDCC.

FUTURES

All Futures which have not been closed out by the last trading day will be marked-to-market up to and including the close of the last trading day. In addition, the seller of a Future must submit a Tender Notice in the Delivery Month in accordance with applicable Contract Specifications.

When a seller of a Future submits a Tender Notice to CDCC, CDCC assigns it to a Clearing Member which is the buyer of a Future in the same Series of Futures in any one of its accounts. Assignment is made specifically to one of these accounts by CDCC. If assignment is made by CDCC to a Client Account, the Clearing Member is responsible for allocating it to a specific client. If assignment is made to a specific Multi-Purpose Account, the Clearing Member must allocate it to the specific Multi-Purpose Account designated by CDCC.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

EXPIRY PROCEDURES

Operations Notices are sent to Clearing Members setting forth the expiry procedures and it is the responsibility of Clearing Members to ensure that they have adequate processes in place to meet requirements and timelines prescribed by CDCC.

OPTIONS

For all information pertaining to the Option expiry procedures, Clearing Members should refer to the Operational Notices which are issued prior to the Expiration Date.

CDCC's Responsibilities on Expiry Friday

1. Review/modify Underlying Interest prices and notify the Clearing Members of any changes.
2. Notify Clearing Members (via e-mail) of any changes in the Production Schedule.
3. Notify Clearing Members (via e-mail) of the status of expiry processes.
4. Assist Clearing Members.

Clearing Members' Responsibilities on Expiry Friday

1. Ensure that the staff responsible for expiry is familiar with all expiry procedures and processes.
2. Validate entries using the Inquiry Screens or the relevant reports:
    a. Verify that all Open Positions and adjustments match internal records, enter any new Transaction or Open Position adjustments accordingly.
    b. Verify that the number of Options that will be automatically exercised on Expiration Date are correct.
    c. For any changes, indicate on the Expiry Response Screen under the "Override" column the total number of Options for each Series of Options to be exercised.
    d. Verify any Out-Of-The-Money Options or At-the-Money Options to be exercised and enter the number of Options under the "Override" column.
3. Validate changes using the reports and/or the on-line access to CDCC Clearing Application (in accordance with timeframes set forth in Section 2 of this Operations Manual).
4. If required, make any allowed modifications (in accordance with timeframes set forth in Section 2 of this Operations Manual).

Daily Expirations (other than Expiry Friday)

When CDCC receives Underlying Interests' closing and opening prices from the relevant Exchange, the prices are specified on the relevant Expiry Report and are used to determine the In-the-Money Options and the Out-of-the-Money Options.

Clearing Members have until the Close of Business on any Business Day up to the Expiration Date to submit an Exercise Notice with respect to American Style Options to CDCC. European Style Options can only be exercised on their Expiration Date.

OTCI Options can expire on any Business Day.

Typically, exercise instructions must be entered online on the CDCC Clearing Application by Clearing Members. However, if unavailable, the following manual process can be used to submit Exercise Notices to CDCC:

1. The proper CDCC Exercise Notice form must be used.
2. The authorization stamp of the Clearing Member must be affixed on the form.

3. The properly delivered Exercise Notice will be accepted at any CDCC office.
4. The Exercise Notice must be properly delivered by five minutes before Close of Business.
5. The Clearing Member staff who deliver the Exercise Notice must be available until CDCC processes the exercise.

The CDCC Clearing Application will ensure that there are sufficient Option Open Positions of the relevant Series of Options in the relevant account of the Clearing Member for exercising the relevant Exercise Notice; if not, CDCC will reject the Exercise Notice. If there are sufficient Option Open Positions, the Clearing Member's Long Position is immediately reduced by the number of Option Open Positions exercised.

AN EXERCISE NOTICE CAN BE CANCELLED UNTIL CLOSE OF BUSINESS ON THE DAY IT IS SUBMITTED.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

OPTIONS

Exercises

Delivery and payment on Exercised Positions are due on the Exercise Settlement Date.

Until Exercise Settlement Date, CDCC continues to require sufficient Margin to ensure that, if a Clearing Member defaults, any Exercise Notice submitted by it or assigned to it, as the case may be, will be completed.

Exercised Positions and Assigned Positions are reported to Clearing Members through relevant reports listed in Section 3 of this Operations Manual.

Assignments

After the Close of Business on any Business Day on which an Exercise Notice is submitted to CDCC, assignment of such Exercise Notice is made on a random selection basis, in which each account of a Member is treated separately. The reason for the separation is to ensure that each Clearing Member's Client Account(s), Firm Account(s), and Multi-Purpose Account(s) have the same probability of being assigned Exercise Notices. When a Clearing Member is assigned an Exercise Notice for a given account (e.g. the Firm Account) it may not allocate that assignment to another account (e.g. a Client Account).

An attempt will be made by CDCC to assign an Exercise Notice for more than 10 Options contracts in blocks not exceeding 10 contracts in each Series of Options.

Exercise Notices assigned to a Clearing Member's Client Account shall be allocated by the Clearing Member to any of its clients based on any method which is equitable and consistent with the rules of the relevant Exchange.

Automatic Exercise - Options and Options on Futures

To safeguard Clearing Members from possible errors, CDCC has instituted an Automatic Exercise procedure for expiring Series of Options. In simple terms, all In-the-Money Options and Options on Futures over predetermined thresholds are automatically exercised by CDCC, unless Clearing Members instruct otherwise.

CDCC establishes predetermined thresholds and informs Clearing Members that every Option and Option on Future above that threshold will be automatically exercised. CDCC will not automatically exercise any At-the-Money Option. CDCC provides a method for Clearing Members to make changes to the Automatic Exercise function of the CDCC Clearing Application. This allows Clearing Members to either opt in or opt out of the Automatic Exercise with respect to the Options and Options on Future they hold. For example, a Member can choose not to exercise an Option that is above the predetermined threshold but to exercise another Option that is At-the-Money or Out-of-the-Money.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

Exercised and Assigned Option Contracts

a) **Exercised Positions**

A Clearing Member who has exercised an Option has an obligation to either deliver the Underlying Interest (in the case of a Put Option) or pay the Exercise Price (in the case of a Call Option).

b) **Assigned Positions**

A Clearing Member who has been assigned an Exercise Notice has the obligation to pay the Exercise Price upon delivery of the Underlying Interest (in the case of a Put Option) or to deliver the Underlying Interest against payment (in the case of a Call Option).

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

FUTURES

Submission of Tender Notices

Tender Notices must be submitted before Close of Business during the relevant FIFO Period (which, subject to any contract adjustment by the Exchange, shall be as follows):

CGB, CGF, CGZ and LGB — two Business Days preceding the first Business Day of the Delivery Month up to and including the second last Business Day preceding the last Business Day of the Delivery Month.

MCX — before Close of Business on the last trading day.

All outstanding Short Positions in BAX, EMF, SXF, SXM, SCF, Sector Index Futures, Share Futures, and Options on Futures are automatically tendered on the last trading day, as per Contract Specifications, after Close of Business.

All outstanding Short Positions in ONX, OIS are automatically tendered on the first Business Day following the contract month, as per Contract Specifications, after Close of Business.

Assignment of Tender Notices

CDCC assigns all Tender Notices to open Long Positions on a random basis with the exception of the Government of Canada Bond Futures (CGB, LGB, CGF and CGZ). Assignments for the CGB, LGB, CGF and CGZ Futures are processed on a First-In-First-Out (FIFO) basis.

Delivery of the Underlying Interest and payment of the Settlement Price is effected by Clearing Members as instructed by CDCC.

FIRST-IN-FIRST-OUT (FIFO) ASSIGNMENT PROCESS

Description of Procedures

The Delivery Months for the CGB, CGF, LGB and CGZ Futures contracts are March, June, September and December as prescribed by the Exchange. When a Member submits a Tender Notice with respect to a Short Position, a Long Position is assigned on a First-In-First-Out (FIFO) basis. CDCC sends out an Operational Notice prior to each relevant FIFO Period to remind Clearing Members of the procedures involved.

On the sixth Business Day prior to the first Business Day of the Delivery Month, each Clearing Member holding Long Positions in the relevant Series of Futures must declare on the CDCC Clearing Application its Long Positions in chronological order for each of its accounts. The entries must include the date the position was opened, the number of contracts and the account. When CDCC assigns a Tender Notice, the Long Position with the oldest date will be assigned first and the Long Position with the most recent date will be assigned last.

During the FIFO Period, Clearing Members must ensure that they update their declarations on a daily basis before Close of Business.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

FIXED INCOME TRANSACTIONS

CDCC acts as central counterparty to all Fixed Income Transactions that are submitted by Clearing Members to CDCC for clearing. All Fixed Income Transactions shall be submitted for clearing to CDCC through the CDS trade matching facility routing matched trades to CDCC. As a result of these Transactions being novated to CDCC, CDCC will be either the buyer or the seller of all settlement records that are sent to the Central Securities Depository.

Various transmissions of settlement records will be sent by CDCC to the Central Securities Depository on a daily basis.

Same Day Transactions gross settlement records

For Same Day Transactions, two settlement records consisting of settlement instructions (Gross Delivery Requirements and Gross Payment Against Delivery Requirements) will be sent gross to the Central Securities Depository to be settled on a real-time basis throughout the day immediately after each Same Day Transaction is novated to CDCC until the Submission Cut-Off Time specified in Section 2 of this Operations Manual.

Forward Settlement Transactions and Futures Contracts on an Acceptable Security net settlement records

For Forward Settlement Transactions and Futures Contracts on Acceptable Securities, settling on the next Business Day, two settlement records consisting of net settlement instructions (Net Delivery Requirements and Net Payment Against Delivery Requirements) will be sent to the Central Securities Depository on a net basis at the Netting Cut Off Time specified in Section 2 of this Operations Manual for settlement on the next Business Day.

Morning net DVP settlement process

In respect of any Pending Payment Against Delivery Requirements at the Morning Netting Cycle Timeframe specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Morning Net Payment Against Delivery Requirements) to the Central Securities Depository reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member. The Clearing Member or its Settlement Agent shall have sufficient funds in its CDS Funds Account to settle the lesser of (i) its Morning Net Payment Against Delivery Requirement and (ii) the amount of the CDCC Daylight Credit Facility during the Morning Net DVP Settlement Timeframe specified in Section 2 of this Operations Manual.

Afternoon net DVP settlement process

In respect of any Pending Settlement Requirements at the Afternoon Netting Cycle Timeframe specified in Section 2 of this Operations Manual, CDCC shall send new settlement records (Afternoon Net DVP Settlement Requirements) to the Central Securities Depository reducing any Pending Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Delivery Requirements of CDCC in favour of the same Clearing Member in respect of the same Acceptable Security, and/or reducing any Pending Payment Against Delivery Requirements of a Clearing Member in favour of CDCC by any Pending Payment Against Delivery Requirements of CDCC in favour of the same Clearing Member. The Clearing Member, or its Settlement Agent, shall have sufficient funds and sufficient Acceptable Securities in its CDS Funds Accounts and CDS Securities Accounts to settle its Afternoon Net DVP Settlement Requirements by the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual.

Delivery

Securities delivery against payment is effected on a DVP basis through the Central Securities Depository.

In the event of a failed or partial delivery, CDCC will take appropriate action in accordance with this Manual and Section A-804 of the Rules.

CDCC shall determine the net settlement instructions by Clearing Member, CUSIP/ISIN and Settlement Date for all Transactions comprised in the Forward Settlement Transactions netting process (as specified in the above section entitled "Forward Settlement Transactions and Futures Contracts on an Acceptable Security net settlement records") submitted to CDCC for clearing as of the Netting Cut Off Time. These settlement instructions shall be submitted to the relevant Central Securities Depository on a daily basis and in the form and settlement tranche acceptable to the Central Securities Depository for this purpose.

For Same Day Transactions, CDCC shall determine the gross settlement instructions (Gross Delivery Requirements and Gross Payment Against Delivery Requirements) by Clearing Member and the applicable CUSIP/ISIN, and submit such instructions to the relevant Central Securities Depository (in the form and settlement tranche acceptable to such Central Securities Depository) immediately after each Same Day Transaction is novated to CDCC for real-time settlement. Notwithstanding the foregoing, at the Morning Netting Cycle Timeframe, CDCC shall cancel previously issued Pending Payment Against Delivery Requirements and replace them by Morning Net Payment Against Delivery Requirements by Clearing Member (as specified in the above section entitled "Morning net DVP settlement process").

In the event of a Failed Delivery for a particular settlement tranche to a Net Delivery Requirement or to an Afternoon Net DVP Settlement Requirement consisting of an obligation to deliver Acceptable Securities by the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual, CDCC shall, on a best efforts basis, attempt to coordinate a partial delivery among those Receivers of Securities for that particular settlement tranche of the relevant Acceptable Security. In the event that no partial settlement is possible, the settlement tranche will be included in the Rolling Delivery Obligation of the failing Clearing Member and CDCC shall re-attempt settlement of the failed settlement tranche on the next Business Day. In the case of a Failed Delivery with respect to a Gross Delivery Requirement resulting from a Same-Day Transaction submitted after the Afternoon Netting Cycle Timeframe and before the Submission Cut-Off Time to be settled by the End of Day DVP Settlement Time, CDCC will fail or partially deliver for the same quantity of Acceptable Securities to the Clearing Member who is the Receiver of Securities with respect to the relevant Same Day Transaction.

In the event of a Failed Payment Against Delivery at the Morning Net DVP Settlement Timeframe specified in Section 2 of this Operations Manual, CDCC shall impose a fine on the Clearing Member corresponding to the charges which are levied on CDCC for the usage of the CDCC Daylight Credit Facility as a result of this Failed Payment Against Delivery. If the Clearing Member still does not have sufficient funds in its CDS Funds Account or that of its Settlement Agent at the Central Securities Depository to settle the relevant Morning Net Payment Against Delivery Requirement, or in the amount of the CDCC Daylight Credit Facility (whichever is less), by 11:00 a.m., the Clearing Member shall be deemed a Non-Conforming Member, in addition to any other remedies that CDCC may apply to such situation in accordance with Subsection A-806(1) of the Rules.

In the event of a Failed Payment Against Delivery at the End of Day DVP Settlement Time specified in Section 2 of this Operations Manual, the Clearing Member shall be deemed a Non-Conforming Member and shall be required to pay to CDCC any charges which are levied on CDCC for the overnight financing of this Failed Payment Against Delivery, in addition to any other remedies that CDCC may apply to such situation in accordance with Subsection A-806(2) of the Rules. CDCC will assist the Clearing Member to remedy the situation so that the Clearing Member can maintain its conforming status. As DVP is not available after the End of Day DVP Settlement Time at the Central Securities Depository (CSD), the Clearing Member must deliver the funds (or acceptable equivalent) outside of the CSD's systems to CDCC prior to CDCC delivering the securities via the CSD.

Buy-In Process (excluding Fixed Income Variation Margin Buy-Ins)

For a Buy-In in respect of the Acceptable Security, the following applies. As set forth in Subsection A-804(3) of the Rules, CDCC may effect a Buy-In transaction on its own initiative or pursuant to a formal request by a Receiver of Securities affected by a Failed Delivery by purchasing the missing quantity of the relevant Acceptable Securities on the open market.

EXERCISES, TENDERS, ASSIGNMENTS AND DELIVERIES

When initiated by a Receiver of Securities, the Buy-In process shall be as follows:

1. The Receiver of Securities who wants to initiate a Buy-In must send to CDCC the appropriate Buy-In Scan Form (which is accessible on CDCC's Secured Website) duly completed, with the following information:
   a. Clearing Member's Name;
   b. Clearing Member's Number;
   c. The Acceptable Security (ISIN) involved;
   d. The total quantity of the Failed Delivery;
   e. The quantity requested in the Buy-In;
   f. The Buy-In delivery date, which shall be the current Business Day + not less than two (2) complete Business Days.

   The Buy-In Scan Form must be submitted to CDCC in the prescribed format with the authorization stamp of the Clearing Member properly affixed on the form (with initials).

2. Upon receiving the duly completed Buy-In Scan Form from a Receiver of Securities, CDCC will work with the Provider(s) of Securities responsible for the Failed Delivery in order to validate if the delivery can be made within the number of Business Days specified in the Buy-In Scan Form (the "Buy-In Notice Delay").

3. At the expiry of the Buy-In Notice Delay, if the Provider(s) of Securities have not delivered the relevant Acceptable Securities, CDCC will initiate a cash trade on the open market.

4. Once delivery is received by CDCC on the cash trade, CDCC will deliver the Acceptable Securities to the Receiver of Securities that requested the Buy-In transaction.

5. All fees incurred to CDCC, including all costs with respect to the Buy-In transaction shall be charged to the Provider(s) of Securities responsible for the Failed Delivery. Such fees will be included on the Monthly Clearing Fees Invoice (MB01) of the second Business Day of each month as a separate pay figure, payable to CDCC on the 5th Business Day of each month through LVTS or any other payment method approved by CDCC.

SETTLEMENT

SETTLEMENT

INTRODUCTION

CDCC provides the mechanism for a single cash settlement with respect to amounts which are not settled through a Central Securities Depository due by a Clearing Member to CDCC and by CDCC to such Clearing Member on a daily basis, as prescribed in Paragraph A-801(2)(a) of the Rules. Clearing Members are able to make a single payment to CDCC or receive a single payment from CDCC that represents the net value of their purchases, sales, gains and losses and, on a monthly basis, clearing fees. Additionally, the CDCS incorporates the amounts due from the Clearing Members for Margin (excluding for the Net Variation Margin Requirement) and the exercise/assignment Settlement Amounts of cash settled Transactions.

Settlement of trading in a given currency is kept separate throughout the clearing procedure. All payments in the Canadian currency to and from CDCC are collected via an irrevocable payment processing system, known as the Large Value Transfer System (LVTS), or any other payment method approved by CDCC. Any US dollar payments are collected via a payment processing system known as Financial Electronic Data Interchange (FEDI). As described in the Risk Manual, the amount of Margin due by a Clearing Member on a given day is computed on the basis of that day's Open Positions shown on the relevant report.

SETTLEMENT CALCULATION

The calculation of a Clearing Member's Net Daily Settlement amount is based on Transactions (including adjustments, exercises, tenders and assignments) and Margin requirements and, on a monthly basis, clearing fees.

The Net Daily Settlement amount for each Clearing Member is determined in the following manner:

(i) The amount of Margin required for the Margin Fund Account are compared with Margin Deposits made by the Clearing Member for such accounts.

(ii) The premiums, Futures Settlement of Gains and Losses, cash settled exercise/assignment Settlement Amounts and cash adjustments for each account type (Client Account(s), Firm Account(s) and Multi-Purpose Account(s)) are netted to a single pay or collect figure.

All cash settlements to CDCC are to be made to CDCC’s settlement account at the Bank of Canada, or to any other account of CDCC with a Schedule I bank, as designated by CDCC.

FINES

CDCC applies fines with regards to late payments to deter Clearing Members from being late in the performance of their payment obligations.

SETTLEMENT

Overnight Settlement

Payments for overnight settlement (Futures mark-to-market, premiums, Margin shortfalls, etc.) must be received by 7:45 a.m. the next Business Day for each Clearing Member (excluding LCMs) and 9:00 a.m. for each LCM.

If a payment is late, CDCC will notify the Clearing Member that it is being fined. The fine structure is as follows:
Based on a rolling thirty days – if there has been a prior occurrence within the preceding thirty days, it is the second occurrence.

The fine schedule described below is subject to the Escalation Procedure applicable for operational issues detailed in Section 11 of this Manual.

For Clearing Members not in a Tri-Party Agreement

First occurrence of a late payment:
- if CDCC receives the payment in its Bank of Canada account by 7:55 a.m. the next Business Day, there will be no fine.
- if the payment is received by 8:30 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment is received by 8:59 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

On the second or more occurrences of a late payment:
- if CDCC receives the payment in its Bank of Canada account by 7:55 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment is received after 7:55 a.m. but before 8:30 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment is received by after 8:30 a.m. but before 8:59 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

For Clearing Members (excluding LCMs) in a Tri-Party Agreement – Margin Shortfalls only

First occurrence of a late payment or delivery:
- if CDCC receives the payment in its Bank of Canada account or if CDCC has evidence that the securities have been received in the appropriate account by 7:55 a.m. the next Business Day, there will be no fine.
- if the payment or delivery is received by 8:30 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment or delivery is received by 8:59 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment or delivery is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

On the second or more occurrences of a late payment or delivery:
- if CDCC receives the payment in its Bank of Canada account or if CDCC has evidence that the securities have been received in the appropriate account by 7:55 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment or delivery is received after 7:55 a.m. but before 8:30 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment or delivery is received by after 8:30 a.m. but before 8:59 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment or delivery is not received by 9:00 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

SETTLEMENT

For LCMs – Margin Shortfalls only

First occurrence of a late payment or delivery:

- if CDCC receives the payment in CDCC's Bank of Canada account designated for such Limited Clearing Member or if CDCC has evidence that the securities have been received in the appropriate account by 9:10 a.m. the next Business Day, there will be no fine.
- if the payment or delivery is received by 9:45 a.m. the next Business Day, CDCC will impose a $1,000 fine.
- if the payment or delivery is received by 10:14 a.m. the next Business Day, CDCC will impose a $2,500 fine.
- if the payment or delivery is not received by 10:15 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

On the second or more occurrences of a late payment or delivery:

- if CDCC receives the payment in CDCC's Bank of Canada account designated for such Limited Clearing Member or if CDCC has evidence that the securities have been received in the appropriate account by 9:10 a.m. the next Business Day, CDCC will impose a $1,000 fine
- if the payment or delivery is received after 9:10 a.m. but before 9:45 a.m. the next Business Day, CDCC will impose a $5,000 fine.
- if the payment or delivery is received by after 9:45 a.m. but before 10:14 a.m. the next Business Day, CDCC will impose a $10,000 fine.
- if the payment or delivery is not received by 10:15 a.m. the next Business Day, CDCC will deem the Clearing Member a Non-Conforming Member.

MARGIN PROCESSING

MARGIN FUND ACCOUNT

Margin Fund Account is the CDCS record provided to each Clearing Member containing all Margin deposited by such Clearing Member to CDCC, in respect of such Clearing Member's Base Initial Margin (or Adjusted Base Initial Margin, as the case may be), Additional Margin for Market Liquidity Risk, Additional Margin for Specific Wrong-Way Risk, Additional Margin for Mismatched Settlement Risk, Additional Margin for Intra-Day Variation Margin Risk, Additional Margin for Unpaid Option Premium Exposure Risk, Additional Margin for Banking Holiday Risk, Additional Margin for Variation Margin Delivery Risk, Additional Capital Margin Risk, Additional Margin for Uncovered Risk of Limited Clearing Members, Variation Margin for Options, and Variation Margin for Unsettled Items, in accordance with the Risk Manual and as set forth in Section 8-1 hereof.

In addition to the foregoing, an amount may be requested from a Clearing Member for the protection of the Corporation, Clearing Members or the investing public, in accordance with section A-702 of the Rules.

Each Clearing Member must record in its Margin Fund Account any deposit made to cover the shortfalls resulting from the requirements. Deposits must be in the form of Eligible Collateral, as specified in the Risk Manual, in an amount sufficient, taking into account the market value and applicable haircuts as specified in Section A-707.

Withdrawals

Clearing Members may request to withdraw any surplus amount from the Margin Fund Account, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual. CDCC will respond within the specified time set forth in Section 2 and, on a best effort basis, approve the withdrawal in CDCC Clearing Application.

Substitutions

A Clearing Member may request to substitute a specific CUSIP/ISIN previously pledged in the Margin Fund Account to the Corporation. The Clearing Member must first pledge equivalent securities and withdraw the existing securities subject to substitution. The value of the equivalent securities so pledged must be equal to or in excess of the securities being withdrawn, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual.

CDCC verifies the validity of each deposit made by Clearing Members and ensures that withdrawals of existing securities subject to substitution do not create deficits in the Clearing Member's Margin Fund Account. CDCC will respond within the specified time set forth in Section 2 and, on a best effort basis, approve the substitution in CDCC Clearing Application.

Pledging (CDS)

Securities pledges in the Margin Fund Account must be performed through CDSX in CDCC's account. The entries on the pledging screen of the CDCC Clearing Application are matched by CDCC to corresponding entries on the reporting system of the relevant Central Securities Depository.

In some cases an exchange of document at a CDCC Office by the Clearing Member (accompanied by a screen print of the entry bearing the Clearing Member's stamp) may be accepted by CDCC as constituting a physical deposit or withdrawal.

After performing all the validation processes, CDCC confirms within the CDCC Clearing Application the Clearing Member's deposits and/or withdrawals.

MARGIN PROCESSING

Deposits, withdrawals and changes thereto will be reflected on the immediately following Business Day's Deposits and Withdrawals Report (MA01). In accordance with the Rules, any discrepancies that the Clearing Member notices against its own records should be reported to CDCC immediately.

Pledging (Tri Party - Securities Account with an Approved Custodian)

Subject to certain conditions, the Corporation may allow Clearing Members to pledge non-cash collateral for the purpose of meeting their Margin requirements pursuant to Rule A-7 (excluding Net Variation Margin Requirements and any other Margin which can otherwise only be cash settled) to a securities account maintained at a third party securities intermediary. The securities intermediary must enter into an Account Control Agreement with respect to the securities account and be an Approved Custodian, each as defined in the Rules.

Use of the Securities Account

1. The securities account shall only be maintained by a securities intermediary which is an Approved Custodian, as defined in the Rules.

2. Any securities held in the securities account maintained by the Approved Custodian, in the name of the Clearing Member, shall be subject to an Account Control Agreement.

3. The Account Control Agreement is a standard agreement that meets certain requirements, as prescribed in the Rules.

4. The securities account may not be used for Net Variation Margin Requirements or for settlement purposes.

5. The respective rights and obligations of the Clearing Member and CDCC with respect to the securities collateral held in the securities account are subject to the Rules, including:

    a. All deposits, withdrawals and substitutions in the securities account are subject to the timeline described in Section 2 of this Manual and to the collateral policy described in Section 2 (Eligible Collateral) of the Risk Manual;

    b. All deposits, withdrawals and substitutions made in the securities account shall also be entered in CDCC Clearing Application in accordance with the timeline described in Section 2 of this Manual and to the collateral policy described in Section 2 (Eligible Collateral) of the Risk Manual;

    c. Any withdrawal of securities held in the securities account is subject to CDCC's approval. The withdrawal must be entered in CDCC Clearing Application by the Clearing Member. A withdrawal authorization form signed by the Clearing Member must be transmitted to CDCC and must include the Clearing Member's approved stamp. CDCC will then, within the specified time to respond to a withdrawal request specified in Section 2, sign and transmit the withdrawal authorization form to the Custodian to proceed with the withdrawal;

    d. Any substitution is subject to the deposit by the Clearing Member of the replacement securities in the securities account before the withdrawal of the replaced securities. Both the deposit and the withdrawal shall also be entered in CDCC Clearing Application by the Clearing Member. A substitution authorization form signed by the Clearing Member must be transmitted to CDCC and must include the Clearing Member's approved stamp. CDCC will then, within the specified time to respond to a substitution request specified in Section 2, sign and transmit the substitution authorization form to the Custodian to proceed with both the deposit and the withdrawal.

MARGIN PROCESSING

Intra-Day Margin Calls

CDCC encourages its Clearing Members to cover Intra-Day Margin Calls with collateral other than cash.

The fine schedule described below is subject to the Escalation Procedure applicable for operational issues detailed in Section 11 of this Manual.

Clearing Members (excluding LCMs) have one (1) hour from notification to cover an Intra-Day Margin Call. If the payment or delivery is late, the following fines shall apply:

- if the payment or delivery is received more than 1 hour after but less than 1 hour and 15 minutes from notification, CDCC will impose a $500 fine.
- if the payment or delivery is received more than 1 hour and 15 minutes but less than 1 hour and 30 minutes from notification, CDCC will impose a $1,000 fine.
- if the payment or delivery is not received by 1 hour and 30 minutes from notification, CDCC will deem the Clearing Member (excluding LCMs) a Non-Conforming Member.

LCMs have two (2) hours from notification or until such Settlement Time as may be provided in Section 2 to cover an Intra-Day Margin Call. If the payment or delivery is late, the following fines shall apply:

- if the payment or delivery is received more than 2 hours after but less than 2 hours and 15 minutes from notification, CDCC will impose a $500 fine.
- if the payment or delivery is received more than 2 hours and 15 minutes but less than 2 hours and 30 minutes from notification, CDCC will impose a $1,000 fine.

if the payment or delivery is not received within 2 hours and 30 minutes from notification, CDCC will deem the LCM a Non-Conforming Member

(FIXED INCOME) VARIATION MARGIN ACCOUNT

The Fixed Income Variation Margin Account is the CDCS record provided to each Clearing Member listing all Margin deposits made by such Clearing Member to CDCC for (Fixed Income) Net Variation Margin Requirement purposes only, in accordance with Section D-607 of the Rules, or otherwise as set forth in Section 8-1 hereof.

(Fixed Income) Net Variation Margin Requirement Settlement

In order to meet a (Fixed Income) Net Variation Margin Requirement, Clearing Members are required to pledge, through CDSX, to CDCC's (Fixed Income) Variation Margin Account, Margin deposits in the form of Eligible Collateral, as specified in the Risk Manual, in an amount sufficient, taking into account the market value and applicable haircuts as specified in Section A-707, to cover any positive variation of the (Fixed Income) Net Variation Margin Requirement owed by a Clearing Member to CDCC.

While the Eligible Collateral must be delivered and pledged to CDCC through CDSX, each Clearing Member must in parallel record in its (Fixed Income) Variation Margin Account such pledge, or any pledge release, to match the entries. The (Fixed Income) Variation Margin Account is solely used to record the pledges or pledge releases, as the case may be, of Margin deposits for (Fixed Income) Net Variation Margin Requirement purposes.

Delivery of the (Fixed Income) Net Variation Margin Requirement

On any given Business Day, each Clearing Member must deliver to the Corporation in CDCC's account at CDS, Eligible Collateral for (Fixed Income) Net Variation Margin Requirement purposes, taking into consideration any shortfall resulting from the variation of the (Fixed Income) Net Variation Margin Requirement, as compared to the (Fixed Income) Net Variation Margin Requirement calculated on the previous Business Day, and the fluctuation of the market value of the Eligible Collateral previously pledged by such Clearing Member to meet its (Fixed Income) Net Variation Margin Requirement.

MARGIN PROCESSING

Upon accepting Eligible Collateral that has been pledged to it through CDSX, CDCC may re-pledge and deliver the Eligible Collateral to a receiving Clearing Member, subject to CDCC's first ranking pledge, and the receiving Clearing Member shall be entitled to re-pledge or re-hypothecate the Eligible Collateral delivered to it.

Each Clearing Member is also required to return to the Corporation the same CUSIP/ISIN that had been allocated and pledged to it by the Corporation as part of the (Fixed Income) Net Variation Margin Requirement delivery, in an amount sufficient to meet the (Fixed Income) Net Variation Margin Requirement shortfalls as indicated on the MS10 report. Clearing Members must return the same CUSIP/ISIN in accordance with the (Fixed Income) Net Variation Margin Requirement Settlement Times. If a Clearing Member fails to return to the Corporation the specific CUSIP/ISIN securities listed on the report but returns equivalent securities instead (a “Fixed Income Variation Margin Delivery Failure”), the Clearing Member will be subject to fines as described below.

<u>Distribution of the (Fixed Income) Net Variation Margin Requirement Collateral</u>

The Corporation will transfer to each Clearing Member being owed a net amount resulting from a change in such Clearing Member’s (Fixed Income) Net Variation Margin Requirement or from the fluctuation of the market value of the Eligible Collateral previously pledged by such Clearing Member to meet its (Fixed Income) Net Variation Margin Requirement, the Variation Margin securities received by the Corporation as part of the (Fixed Income) Net Variation Margin Requirement. The Corporation will in priority return the same CUSIP/ISIN previously pledged to the Corporation by such Clearing Member, subject to the specific procedures described below in the event of a Fixed Income Variation Margin Delivery Failure or of a substitution request.

<u>Substitution of Pledged Securities Collateral for the (Fixed Income) Variation Margin Account</u>

1. **(Fixed Income) Variation Margin Account Collateral substitution request:**

   A Clearing Member may request to substitute a specific CUSIP/ISIN previously pledged in the (Fixed Income) Variation Margin Account to the Corporation. The request for substitution must be received by the Corporation before 11:00 a.m. for same day settlement. Clearing Member must first pledge equivalent securities and withdraw the existing securities subject to substitution. The value of the equivalent securities so pledged must be equal to or in excess of the securities being withdrawn. Substitution of a specific CUSIP/ISIN requested for same day settlement will be completed by 3:00 p.m. by the Corporation, subject to the Buy-In process below.

2. **(Fixed Income) Variation Margin Account Securities Collateral substitution notice:**

   The Corporation will inform by 12:00 p.m. (noon) any Clearing Member subject to a substitution request (the “Holder of securities”) for a same day settlement. The Holder of securities will have until 3.00 p.m. to deliver the securities to CDCC's (Fixed Income) Variation Margin Account. Failure to deliver by the Holder of securities by the cut-off time will be considered a Fixed Income Variation Margin Delivery Failure and will result in fines being applied to the Holder of securities as described below.

FIXED INCOME VARIATION MARGIN DELIVERY FAILURE

Fines

CDCC will apply fines for failure to return distributed securities.

CDCC will apply fines for failure to return securities subject to a substitution notice, by the appropriate deadline.

For each day between the day of the original return obligation and the delivery date (the "Fail Period") a fine will be applied (Fail fees). The Fail fee is based on a rate equal to 1-month CDOR, which is fixed on a monthly basis and is applied daily. CDCC shall immediately notify the Clearing Member to which a fine is imposed.

Throughout the Fail Period, CDCC will require to receive Eligible Collateral of a value equivalent to the value of the unreturned securities and CDCC will deliver such replacement securities to the receiving Clearing Member (the "Replacement Securities"). At the end of the Fail Period, the Replacement Securities will be returned from the receiving Clearing Member to the delivering Clearing Member.

The fines described above are subject to the Escalation Procedure applicable for operational issues detailed in Section 11 of this Manual.

Collection of Fines

CDCC will collect any applicable fines with the month-end clearing fee billing.

Fixed Income Variation Margin Buy-In process for Fixed Income Variation Margin Delivery Failure

The Receiver of securities affected by a Fixed Income Variation Margin Delivery Failure may request that the Corporation execute a Buy-In on the day following the market standard settlement (T+2 / T+3, where T is the day of the original date of the request).

Same day settlement will be executed by CDCC on a best efforts basis. In the event of a failure to deliver by the counterparty to the Buy-In transaction on the same day, CDCC will execute the Buy-In transaction the following day without liability.

The Corporation shall only execute a Buy-In transaction pursuant to a formal request by a Receiver of securities affected by a Failed Delivery, by purchasing on the open market the collateral of the specified quantity and CUSIP/ISIN.

When initiated by a Receiver of securities, the Buy-In process shall be as follows:

1. The Receiver of securities who wants to initiate a Buy-In must send to the Corporation the appropriate Buy-In Scanned Form (which is accessible on CDCC's Secured Website) duly completed with the following information:
   a. Clearing Member's Name;
   b. Clearing Member's Number
   c. The specific securities (Eligible Collateral) (ISIN) involved;
   d. The total quantity of the Failed Delivery;
   e. The quantity requested in the Buy-In;
   f. The Buy-In delivery date, which shall be the current Business Day + no less than two (2) complete Business Days.

   The Buy-In Scanned Form must be submitted to CDCC in the prescribed format with the authorization stamp of the Clearing Member properly affixed on the form (with initials) before 10:00 a.m.

2. Upon receiving the duly completed Buy-In Scanned Form from a Receiver of securities, the Corporation will work with the Holder(s) of securities responsible for the Failed Delivery in order to validate if the delivery can be made within the number of Business Days specified in the Buy-In Scan Form (the "Buy-In Notice Delay").

3. At the expiry of the Buy-In Notice Delay, if the Provider(s) of securities has not delivered the relevant securities, the Corporation will initiate a cash trade on the open market.

4. Upon receipt of the securities, CDCC will deliver the requested securities to the Receiver that initiated the Buy-In transaction.

5. All fees incurred by the Corporation, including all costs with respect to the Buy-In transaction shall be charged to the Provider(s) of securities responsible for the Failed Delivery. Such fees will be included on the Monthly Clearing Fees Details Report (MB01) produced on the second Business Day of each month as a separate pay figure, payable to the Corporation on the fifth Business Day of each month through LVTS or any other payment method approved by the Corporation.

CLEARING FUND

Each Clearing Member (excluding LCMs) approved to clear Exchange Transactions and/or OTCI Transactions and/or Fixed Income Transactions shall maintain a deposit in the Clearing Fund of the amounts from time to time required by CDCC in accordance with Rule A-6. The Clearing Fund has been established to protect CDCC and its Clearing Members (including their Affiliate(s)) from potential defaults and other market events and shall be used for the purposes set out in Section A-609 and Subsection A-701(2) of the CDCC Rules.

Each Clearing Member's (excluding LCMs) contribution includes a required Base Deposit and a Variable Deposit. The details of the Base and Variable Deposits are set forth in Rule A-6.

Clearing Fund Statement Report

On the first Business Day of each calendar month, CDCC shall issue to each Clearing Member (excluding LCMs) a Clearing Fund statement that shall list the current amount of such Clearing Member's deposits to the Clearing Fund and the amount of deposit, which is based on the monthly calculation of the Variable Deposit, required of such Clearing Member. CDCC will also issue a Clearing Fund statement (MA71) intra-monthly if an increase to the Variable Deposit is necessary. Any deficit between the amounts held on deposit and the deposit required to be made by a Clearing Member must be satisfied by 2:00 p.m. on the next Business Day.

Deposits

Deposits to the Clearing Fund shall be in the form of Eligible Collateral as specified in the Risk Manual, in an amount sufficient, taking into account the market value and applicable haircuts as specified in Section A-707. Deposits to the Clearing Fund are made and valued in the same manner and are subject to the same deadlines as for Margin deposits, as set forth in Section 2 of this Operations Manual.

Withdrawals

Clearing Members (excluding LCMs) may request to withdraw any surplus amount from the Clearing Fund, subject to applicable deadlines, as set forth in Section 2 of this Operations Manual.

Substitutions

Substitutions of assets (other than cash) in the Clearing Fund are made in the same manner and subject to the same deadlines as Margin Fund Account substitutions of assets (other than cash), as set forth in Section 2 of this Operations Manual.

Pledges

Securities pledges must be performed through CDSX in CDCC's account. The entries on the pledging screen of the CDCC Clearing Application are matched by CDCC to corresponding entries on the reporting system of the relevant Central Securities Depository.

MARGIN PROCESSING

CLEARING FEES

CLEARING FEES

Clearing services fees

Clearing fees are charged to both Clearing Members submitting a Transaction for clearing to CDCC and are based on the number of contracts involved. There is a minimum monthly clearing fee charge with respect to certain product types (Futures, Options and OTCI (other than Fixed Income Transactions)). Once a Clearing Member, otherwise eligible to do so in accordance with the Rules, starts using a particular clearing service by submitting a first Transaction of such product type, the applicable minimum monthly clearing fee shall be charged to the Clearing Member thereafter whether the Clearing Member actually uses the services or not during any given month, until the Clearing Member duly notifies CDCC in writing that it wishes to withdraw from the clearing services for that product type, effective sixty (60) days after CDCC receives such notice, provided there is no outstanding Transaction of such product type standing to an account of the Clearing Member at such time. Clearing Members should refer to the CDCC website www.cdcc.ca for a complete list of applicable fees.

Clearing fees are collected as a separate pay figure and are payable to CDCC on the morning of the 5th Business Day of each month through LVTS or any other payment method approved by CDCC. The MB01 Monthly Clearing Fees Invoice, MB02 Monthly Clearing Fees Details Reports and MB03 Monthly Fixed Income Clearing Fees Invoice are generated on every 2nd Business Day of each month and are available to Clearing Members on the morning of the 3rd Business Day of each month.

Fees for additional services

There are a number of discretionary services available to Clearing Members, in addition to the normal clearing services. These are published periodically as an Operational Notice to Members and can be viewed on the Secured Website. CDCC issues a statement on a monthly basis for these services. The fees are collected as per the date on the statement through LVTS or any other payment method approved by CDCC.

Fees for cost incurred at CDS (or other Central Securities Depository)

Any settlement cost incurred by CDCC within CDSX (or the settlement platform of another Central Securities Depository) will be charged to the Clearing Member with which CDCC is settling. Such cost will be included on the Monthly Clearing Fees Details Report (MB01) of the second Business Day of each month as a separate pay figure, payable to CDCC on the 5th Business Day of each month through LVTS or any other payment method approved by CDCC.

Clearing Members shall designate up to three (3) individuals within their firm who will be responsible for handling the Clearing Member's User Profiles ("Security Officers"). The designation of Securities Officers is done by filing with CDCC a CDCS Clearing – Security Officer Identification form, which form shall be renewed on an annual basis.

Once duly designated, a Security Officer shall submit a CDCS Clearing User Profile Request form to request that CDCC add or delete a User Profile (this form is accessible on CDCC's Secured Website).

SECURITY OFFICER

SECURITY OFFICER

The Security Officer must complete this form with the authorization stamp of the Clearing Member properly affixed on the form (with initials). When the form is complete, the Clearing Member can either scan the form and send it to the Corporate Operations group e-mail address: cdcc-ops@tmx.com, or fax the form to one of CDCC's offices.

Upon receipt of the form, the process for the addition / deletion is performed by one of CDCC's senior managers.

ESCALATION PROCEDURE

ESCALATION PROCEDURE

A failure by a Clearing Member to meet a payment, transfer, deposit, delivery, or acceptance of delivery when such obligation becomes due under the Rules (for the purpose of this Section 11 - Escalation Procedure, a "Payment Failure") as a result of an operational issue, including any material systems failure, malfunction, or delay encountered by a Clearing Member or its securities intermediary, including its Settlement Agent, Approved Depository, or Approved Custodian, (an "Operational Issue") shall be managed by the Corporation in accordance with the following procedure, (the "Escalation Procedure").

1) Communication

   a) For the purposes of this Escalation Procedure:
      i) a CDCC Level 1 contact shall be a Director Operations, or its equivalent;
      ii) a CDCC Level 2 contact shall be a Vice-President Operations, or its equivalent;
      iii) a CDCC Level 3 contact shall be the President and Chief Clearing Officer or Vice-President and Chief Risk Officer;
      iv) a Clearing Member Level 1 contact shall be a Director of Operations, or its equivalent;
      v) a Clearing Member Level 2 contact shall be a Vice-President Operations, or its equivalent; and
      vi) a Clearing Member Level 3 contact shall be a senior executive reporting directly to the president of the Clearing Member, or to its equivalent in the absence of a senior executive of the Clearing Member bearing the title "president".

   b) The CDCC Level 1 contact shall, immediately upon acquiring actual knowledge or confirmation of a Payment Failure by a Clearing Member, notify the Clearing Member Level 1 contact of the Payment Failure. The Clearing Member Level 1 contact shall, within a reasonable period of time, confirm the nature of the issue that caused the Payment Failure and, promptly upon providing such confirmation, proceed to provide the Corporation with the required information in accordance with the Operational Issue Resolution Notice defined below.

   c) In the event that (i) the Clearing Member Level 1 contact fails to respond to the CDCC Level 1 contact within a reasonable period of time, (ii) the Clearing Member Level 1 contact cannot confirm the nature of the issue that caused the Payment Failure, or (iii) the information provided by the Clearing Member Level 1 contact regarding the nature of the Operational Issue that caused the Payment Failure is deemed unsatisfactory by the Corporation, the CDCC Level 2 contact shall immediately contact the Clearing Member Level 2 contact. The Clearing Member Level 2 contact shall, promptly upon being contacted in accordance with this subsection, proceed to provide the Corporation with the required information in accordance with the Operational Issue Resolution Notice defined below.

   d) In the event that (i) the CDCC Level 2 contact fails to reach the Clearing Member Level 2 contact within a reasonable period of time, (ii) the Clearing Member Level 2 contact cannot confirm the nature of the Operational Issue that caused the Payment Failure, or (iii) the information provided by the Clearing Member Level 2 contact regarding the nature of the Operational Issue that caused the Payment Failure is deemed unsatisfactory by the Corporation, the CDCC Level 3 contact shall immediately contact the Clearing Member Level 3 contact. The Clearing Member Level 3 contact shall, within an hour after being contacted in accordance with this subsection, proceed to provide the Corporation with the required information in accordance with the Operational Issue Resolution Notice defined below.

ESCALATION PROCEDURE

2) Operational Issue Resolution Notice

a) Upon receiving notification by the Corporation of the Payment Failure in accordance with Section 1 of this Escalation Procedure, if the Clearing Member Level 1, 2, or 3 contact, as the case may be, confirms in accordance with Subsection 1 that the Payment Failure is solely due to an Operational Issue, such Clearing Member Level 1, 2, or 3 contact, as the case may be, shall provide the Corporation with a written confirmation of the nature of the Operational Issue that caused the Payment Failure and a detailed description of the steps proposed to be taken by the Clearing Member to resolve the Operational Issue (together, the "Operational Issue Resolution Notice"). Where the Operational Issue affects the Clearing Member's securities intermediary (including its Settlement Agent, Approved Depository or Approved Custodian), the Clearing Member shall immediately provide the Corporation with the contact details for the relevant representative of such securities intermediary's and include such representative in every communication with the Corporation related to the Operational Issue until the full resolution of the Operational Issue.

b) The Operational Issue Resolution Notice shall be re-issued by the Clearing Member Level 3 contact, to the Corporation on each day on which the Payment Failure persists, until there is a full resolution of the Operational Issue to the satisfaction of the Corporation.

3) Mitigation Tools

Immediately upon the occurrence of a Payment Failure, the Clearing Member shall use its best efforts to resolve the Operational Issue, and to mitigate the Payment Failure by the use of the following mitigation tools (the "Mitigation Tools") before 3:45 pm, where necessary:

a) The Exception Process Request after the start of CDS payment exchange, where applicable, or
b) The Payment Delay Request.

4) Delayed Resolution

On any Business Day on which an Operational Issue Resolution Notice remains in effect, in the event that the Corporation is of the view that the Operational Issue is expected, or likely, to persist until the next following Business Day,

a) The Corporation may determine that no Transaction shall be cleared by the Corporation for such Clearing Member until resolution; and

b) The Clearing Member Level 3 contact shall provide written confirmation that the Payment Failure is solely due to an Operational Issue and that the Clearing Member has used its best efforts to use the Mitigation Tools, and requests, if necessary, no later than 3:45 pm on the Business Day on which the first notification of the Payment Failure has been made, by a Payment Delay Request that the Corporation funds the Clearing Member's obligations of payment to the Corporation until the next following Business Day. The Clearing Member shall, upon request by the Corporation, represent and warrant to each of the Corporation's lender, acknowledging and confirming that each of the Corporation and the lender is relying on such representations and warranties without independent inquiry, that the Payment Failure is solely due to an Operational Issue and that no financial condition is affecting the Clearing Member in such a way that the provision of temporary funding in accordance with this section could jeopardize the interest of the Corporation or other Clearing Members. In the event that temporary funding is provided in accordance with this section, all fees and costs incurred by the Corporation in connection with such funding shall be added to and become part of the payment obligation owed by the Clearing Member to the Corporation and will become due immediately.

5) Non-Conforming

ESCALATION PROCEDURE

a) If no Mitigation Tool has been successfully implemented by the Clearing Member by the end of the Business Day on which the first notification of the Payment Failure has been made, the Corporation may declare the Clearing Member a Non-Conforming Member provided that the President & Chief Clearing Officer (or its designate) of the Corporation, prior to such designation, notifies the appropriate senior officer of the Bank of Canada in accordance with the Bank of Canada communication requirements.

b) If a Mitigation Tool has successfully been used by the Clearing Member but the Corporation is not satisfied with the information provided pursuant to the Operational Issue Resolution Notice, or considers that the steps proposed to be taken by the Clearing Member to resolve the Operational Issue expose the Corporation to an unacceptable level of risk, the Corporation may declare the Clearing Member a Non-Conforming Member, provided that the President & Chief Clearing Officer (or designate) of the Corporation prior to such designation notifies the appropriate senior officer of the Bank of Canada in accordance with the Bank of Canada communication requirements. The Corporation shall not exercise this discretion without having first performed the Escalation Procedure pursuant to Section 11 within a reasonable timeframe upon acquiring actual knowledge or confirmation of a Payment Failure by a Clearing Member and will not exercise this discretion before 10:00 am on the day following the receipt of the Level-3 Operational Issue Resolution Notice, unless the Clearing Member has not confirmed that the Payment Failure results from an Operational Issue.

PART B – OPTIONS

[...]

RULE B-4
DELIVERY AND PAYMENT WITH RESPECT TO OPTIONS EXERCISED

[…]

SECTION B-412
DEPOSIT OF SECURITY FUNDS

~~(1) Where a Delivering Clearing Member has defaulted on the delivery of an Underlying Interest, it shall become a Non-Conforming Member and it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds in an amount equal to not less than 105% of the market value of the Underlying Interest to be delivered. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section B-409, shall end. The deposit of the Security Funds with the Corporation as herein provided does not discharge any obligation of such Clearing Member to the Corporation including the payment of any penalties or the payment of costs incurred by the Corporation in connection with the Clearing Member's default, and does not preclude the suspension of such Clearing Member under Section A-1A05 or the assessment of additional sanctions under Rule A-4 and Rule A-5.~~

(1) Where a Receiving Clearing Member has failed to accept the delivery of an Underlying Interest and make payment therefor, it shall become a Non-Conforming Member and it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds equal to the settlement value, or, in the sole discretion of the Corporation, in an amount equal to the difference between the liquidating value of the Underlying Interest and the settlement value, or such other amount as the Corporation may determine. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section B-409, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Clearing Member to the Corporation including the payment of any penalties or payment of costs incurred by the Corporation in connection with the Clearing Member's default, and does not preclude the suspension of such Clearing Member under Section A-1A05 or the assessment of additional sanctions under Rule A-4 and Rule A-5.

(2) Subject to Subsection A-701(3), the Security Funds deposited by a Non-Conforming Member shall be used, together with other Margin Deposits of the Non-Conforming Member, by the Corporation to effect delivery of or make payment in respect of the Underlying Interest, or otherwise meet the Corporation's obligations in respect of the transaction, or for any of the other purposes set forth in Subsection A-701(2).

[…]

PART C – FUTURES

RULE C-5
DELIVERY OF UNDERLYING INTEREST OF FUTURES

[…]

SECTION C-517
DEPOSIT OF SECURITY FUNDS

~~(1) Where a Non-Conforming Member has defaulted on the delivery of an Underlying Interest other than an Acceptable Security, it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds in an amount equal to not less than 105% of the market value of the Underlying Interest to be delivered. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section C-514, shall end. The deposit of the Security Funds with the Corporation as herein provided does not discharge any obligation of such Non-Conforming Member to the Corporation including the payment of any penalties or the payment of costs incurred by the Corporation in connection with the Non-Conforming Member's default, and does not preclude the suspension of such Non-Conforming Member pursuant to Section A-1A05, or the assessment of additional sanctions under Rule A-4 and Rule A-5.~~

~~(2)~~(1) Where a Non-Conforming Member has failed to accept the delivery of an Underlying Interest other than an Acceptable Security and make payment therefor, it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds equal to the settlement value, or, in the absolute discretion of the Corporation, in an amount equal to the difference between the liquidating value of the Underlying Interest and the settlement value, or such other amount as the Corporation may determine. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section C-514, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Non-Conforming Member to the Corporation including the payment of any penalties or payment of costs incurred by the Corporation in connection with the Non-Conforming Member's default, and does not preclude the suspension of such Non-Conforming Member pursuant to Section A-1A05, or the assessment of additional sanctions under Rule A-4 and Rule A-5.

~~(3)~~(2) Subject to Subsection A-701(3), the Security Funds deposited by a Non-Conforming Member shall be used, together with other Margin Deposits of the Non-Conforming Member, by the Corporation to effect delivery of or make payment in respect of the Underlying Interest, or otherwise meet the Corporation's obligations in respect of the transaction, or for any of the other purposes set forth in Subsection A-701(2).

[…]

PART D – OVER-THE-COUNTER INSTRUMENTS ("OTCI")

RULE D-3
PHYSICAL DELIVERY OF UNDERLYING INTEREST ON OVER-THE-COUNTER INSTRUMENTS

The Sections of this Rule D-3 shall only apply to physically delivered OTCI, excluding Fixed Income Transactions.

[…]

SECTION D-307
DEPOSIT OF SECURITY FUNDS

In the event where the failure of delivery originates from an OTCI transaction applying to a Market Centre not served by a Guaranteeing Delivery Agent, the following shall apply:

~~(1) Where a Non-Conforming Member has defaulted on the delivery of an Underlying Interest, it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds in an amount equal to not less than 105% of the market value of the Underlying Interest to be delivered. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section D-305, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Non-Conforming Member to the Corporation including the payment of any penalties or the payment of costs incurred by the Corporation in connection with the Non-Conforming Member's default, and does not preclude the suspension of such Non-Conforming Member pursuant to Section A-1A05, or the assessment of additional sanctions under Rule A-4 and Rule A-5.~~

~~(2)~~(1) Where a Non-Conforming Member has failed to accept the delivery of an Underlying Interest and make payment thereof, it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds equal to the settlement value, or, in the absolute discretion of the Corporation, in an amount equal to the difference between the liquidating value of the Underlying Interest and the settlement value, or such other amount as the Corporation may determine. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section D-305, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Non-Conforming Member to the Corporation including the payment of any penalties or payment of costs incurred by the Corporation in connection with the Non-Conforming Member's default, and does not preclude the suspension of such Non-Conforming Member pursuant to Section A-1A05, or the assessment of additional sanctions under Rule A-4 and Rule A-5.

~~(3)~~(2) Subject to Subsection A-701(3), the Security Funds deposited by a Non-Conforming Member shall be used, together with other Margin Deposits of the Non-Conforming Member, by the Corporation to effect delivery of or make payment in respect of the Underlying Interest, or otherwise meet the Corporation's obligations in respect of the transaction, or for any of the other purposes set forth in Subsection A-701(2).

~~(4)~~(3) Where the Corporation has effected delivery of or made payment for the Underlying Interest, or otherwise settled the transaction, and the cost of so doing exceeds the Security Funds (if any) deposited under Subsection D-307(3), and the Non-Conforming Member's Margin or Clearing Fund deposits, the Non-Conforming Member shall be liable to and shall promptly pay the Corporation the amount of the excess, in addition to any penalties and other sanctions that may be assessed, and the Corporation's reasonable expenses, including legal fees.

~~(5)~~(4) Where the Corporation has effected delivery of or made payment for the Underlying Interest, or otherwise settled the transaction, and the cost of so doing is less than the Security Funds (if any) deposited under Subsection D-307(3), any excess, less all assessed penalties and reasonable expenses, including legal fees, incurred by the Corporation, will be promptly returned to the Non-Conforming Member.

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PART B – OPTIONS

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RULE B-4
DELIVERY AND PAYMENT WITH RESPECT TO OPTIONS EXERCISED

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SECTION B-412
DEPOSIT OF SECURITY FUNDS

(1) Where a Receiving Clearing Member has failed to accept the delivery of an Underlying Interest and make payment therefor, it shall become a Non-Conforming Member and it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds equal to the settlement value, or, in the sole discretion of the Corporation, in an amount equal to the difference between the liquidating value of the Underlying Interest and the settlement value, or such other amount as the Corporation may determine. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section B-409, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Clearing Member to the Corporation including the payment of any penalties or payment of costs incurred by the Corporation in connection with the Clearing Member's default, and does not preclude the suspension of such Clearing Member under Section A-1A05 or the assessment of additional sanctions under Rule A-4 and Rule A-5.

(2) Subject to Subsection A-701(3), the Security Funds deposited by a Non-Conforming Member shall be used, together with other Margin Deposits of the Non-Conforming Member, by the Corporation to effect delivery of or make payment in respect of the Underlying Interest, or otherwise meet the Corporation's obligations in respect of the transaction, or for any of the other purposes set forth in Subsection A-701(2).

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PART C – FUTURES

RULE C-5
DELIVERY OF UNDERLYING INTEREST OF FUTURES

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SECTION C-517
DEPOSIT OF SECURITY FUNDS

(1) Where a Non-Conforming Member has failed to accept the delivery of an Underlying Interest other than an Acceptable Security and make payment therefor, it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds equal to the settlement value, or, in the absolute discretion of the Corporation, in an amount equal to the difference between the liquidating value of the Underlying Interest and the settlement value, or such other amount as the Corporation may determine. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section C-514, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Non-Conforming Member to the Corporation including the payment of any penalties or payment of costs incurred by the Corporation in connection with the Non-Conforming Member's default, and does not preclude the suspension of such Non-Conforming Member pursuant to Section A-1A05, or the assessment of additional sanctions under Rule A-4 and Rule A-5.

(2) Subject to Subsection A-701(3), the Security Funds deposited by a Non-Conforming Member shall be used, together with other Margin Deposits of the Non-Conforming Member, by the Corporation to effect delivery of or make payment in respect of the Underlying Interest, or otherwise meet the Corporation's obligations in respect of the transaction, or for any of the other purposes set forth in Subsection A-701(2).

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PART D – OVER-THE-COUNTER INSTRUMENTS ("OTCI")

RULE D-3
PHYSICAL DELIVERY OF UNDERLYING INTEREST ON OVER-THE-COUNTER INSTRUMENTS

The Sections of this Rule D-3 shall only apply to physically delivered OTCI, excluding Fixed Income Transactions.

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SECTION D-307
DEPOSIT OF SECURITY FUNDS

In the event where the failure of delivery originates from an OTCI transaction applying to a Market Centre not served by a Guaranteeing Delivery Agent, the following shall apply:

(1) Where a Non-Conforming Member has failed to accept the delivery of an Underlying Interest and make payment thereof, it must deliver to the Corporation, within one hour after the Time of Delivery, Security Funds equal to the settlement value, or, in the absolute discretion of the Corporation, in an amount equal to the difference between the liquidating value of the Underlying Interest and the settlement value, or such other amount as the Corporation may determine. Upon such delivery, the calculation of penalties and implementation of restrictions, as provided for in Section D-305, shall end. The deposit of the Security Funds with the Corporation, after the required delivery time, does not discharge any obligation of such Non-Conforming Member to the Corporation including the payment of any penalties or payment of costs incurred by the Corporation in connection with the Non-Conforming Member's default, and does not preclude the suspension of such Non-Conforming Member pursuant to Section A-1A05, or the assessment of additional sanctions under Rule A-4 and Rule A-5.

(2) Subject to Subsection A-701(3), the Security Funds deposited by a Non-Conforming Member shall be used, together with other Margin Deposits of the Non-Conforming Member, by the Corporation to effect delivery of or make payment in respect of the Underlying Interest, or otherwise meet the Corporation's obligations in respect of the transaction, or for any of the other purposes set forth in Subsection A-701(2).

(3) Where the Corporation has effected delivery of or made payment for the Underlying Interest, or otherwise settled the transaction, and the cost of so doing exceeds the Security Funds (if any) deposited under Subsection D-307(3), and the Non-Conforming Member's Margin or Clearing Fund deposits, the Non-Conforming Member shall be liable to and shall promptly pay the Corporation the amount of the excess, in addition to any penalties and other sanctions that may be assessed, and the Corporation's reasonable expenses, including legal fees.

(4) Where the Corporation has effected delivery of or made payment for the Underlying Interest, or otherwise settled the transaction, and the cost of so doing is less than the Security Funds (if any) deposited under Subsection D-307(3), any excess, less all assessed penalties and reasonable expenses, including legal fees, incurred by the Corporation, will be promptly returned to the Non-Conforming Member.

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